The Mining Journal

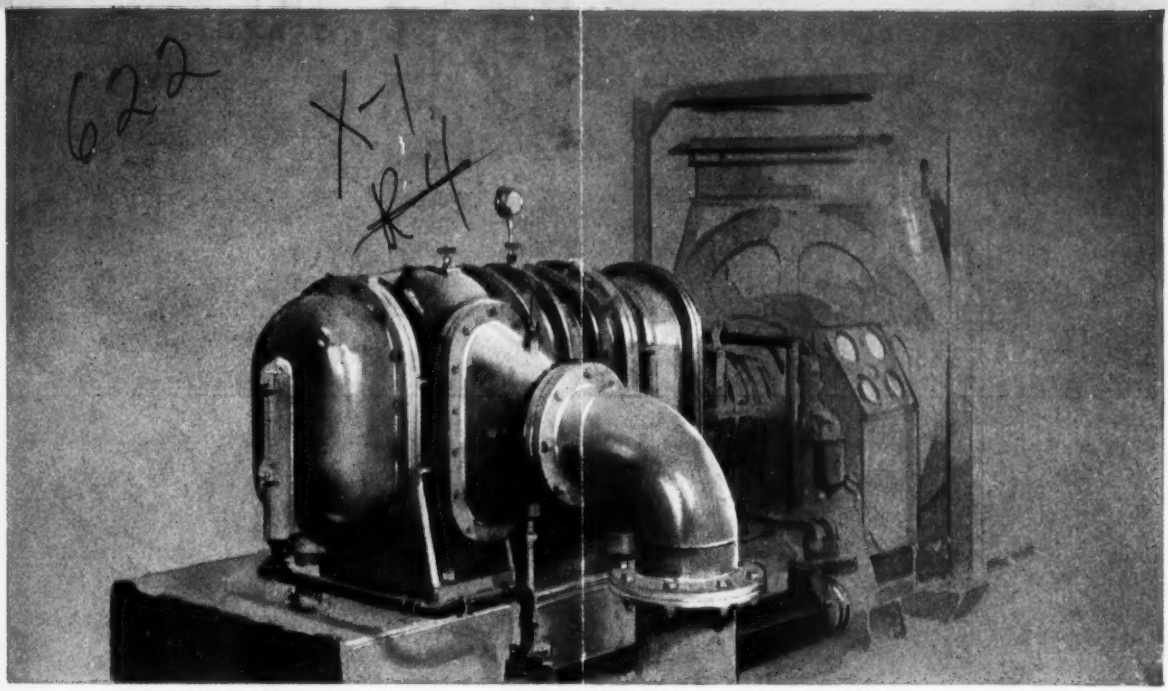
LONDON, AUGUST 26, 1960

Vol. 255. No. 6523.

THE JOHN CRERAR LIBRARY
SEP 15 1960

Price Ninepence

622
X-1
R4



Howden compressor, capacity 3,500 c.f.m. (210,000 c.f.hr.) at 30 p.s.i.g. boosting town's gas at the Northern Gas Board's Works at Darlington

HOWDEN COMPRESSORS

UNEQUALLED EXPERIENCE Howden's experience of manufacturing and operating rotary-screw compressors is unequalled anywhere in the world, and Howden are the only manufacturers in Britain manufacturing - and holding world selling rights for - these compressors for stationary industrial applications.

BASIC ADVANTAGES. Absolutely oil-free air or gas is delivered, since the rotors do not make metallic contact and therefore do not need lubricating.

The compressor has a purely rotary action and is free from unbalanced forces. Running at high speed, it is smaller and lighter than any reciprocating compressor of equal capacity; it can be installed on light foundations, even in soft ground.

The compressor is valveless, reducing maintenance time and cost.

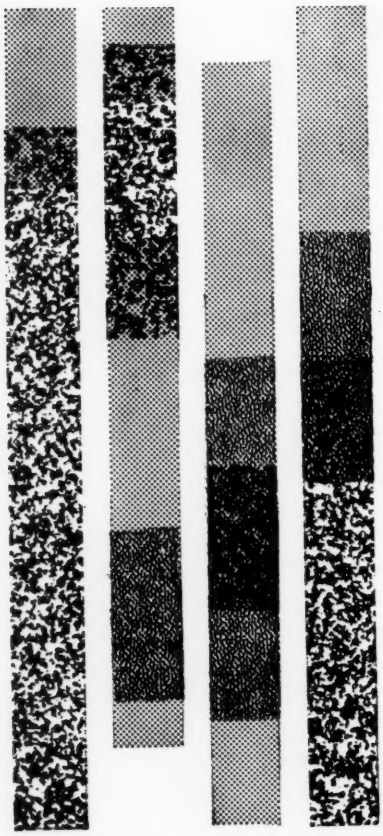
Flow delivery is steady and free from pulsations; the receiver required is therefore smaller.

The Howden rotary-screw compressor is the most advanced in the world.

JAMES HOWDEN AND COMPANY LIMITED
195 SCOTLAND STREET, GLASGOW, C.5 and 15 GROSVENOR PLACE, LONDON, S.W.1

HOWDEN

CORE RECOVERY...



"Over our long history as drilling contractors, we have specialised in mineral prospecting with maximum core recovery."

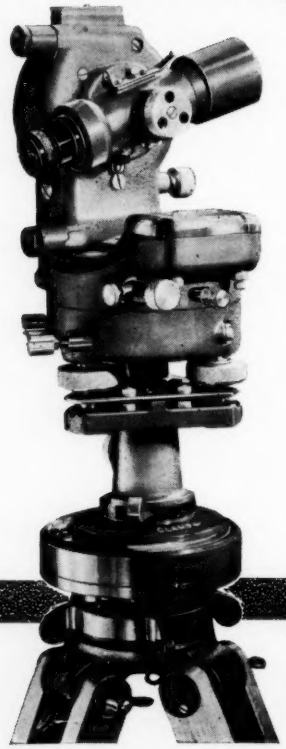
JOHN THOM LIMITED

CHADDOCK LANE, BOOTHSTOWN
WALKDEN, LANCS.

Telephone : Walkden 3271/2/3
Telegrams : "Thom-Walkden"

A Member of the Cementation Group of Companies.

Watts Mining Transit



For elementary surveying above and below ground to an accuracy better than 1 : 3000.

The Mining Transit is a simple, light instrument with glass circles divided at 5-minute intervals, and it is easily read to 1 minute.

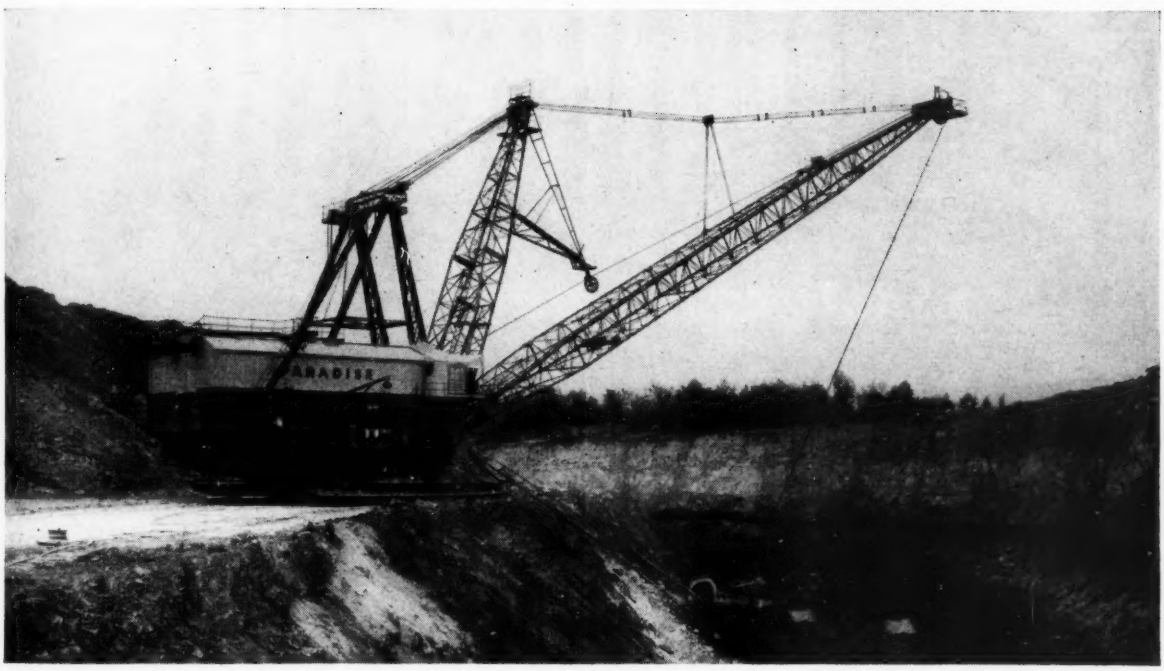
HILGER & WATTS

For full details, write for CS 58/h38
HILGER & WATTS LTD., 98 ST. PANCRAS WAY, LONDON, N.W.1
Telephone: GULliver 5636

Where DEEP DIGGING and LONG REACH are required to remove HUGE QUANTITIES of materials at LOWEST COST...

BUCYRUS-ERIE WALKING DRAGLINES

are first choice



The walking dragline operates on a 'tub' that gives it great floatation. Its walking system is simple and its greatly increased stability over normal excavators allows the operator to use longer booms and to reach a greater working area from each set position, thus reducing the number of moves. Maintenance is low compared to any other type of excavator and for certain types of work its capacity is bigger and its dirt-per-hour cost is lower. Although the traction of the walking dragline may be of lower speed in comparison with the crawler type its unique manœuvrability more than makes up for the slightly lower move-up speed.

The Bucyrus-Erie 770-B Ward-Leonard electric walking dragline in the illustration weighs approximately 850 tons and the boom can be either 190′ or 225′ in length, carrying a bucket of from 14 to 20 cubic yards capacity. A similar machine to this will shortly be installed in Australia to fulfil an order placed by Electricity Trust of South Australia and it will be the largest dragline excavator ever imported into that Continent. The machine, when installed, will be employed stripping over-burden at an estimated rate of 800 tons per hour, excavating 24 tons in each working cycle of operation from a depth of 140′ and depositing the material to a dump 100′ high by means of its 240′ boom. The electric motors used for its operation will aggregate 1500 h.p.

BUCYRUS-ERIE COMPANY
South Milwaukee, Wisconsin, U.S.A.
RUSTON-BUCYRUS LIMITED, LINCOLN, ENGLAND

BUCYRUS ERIE

FLUORSPAR

METALLURGICAL
CERAMIC
ACID GRADES

in lumps or powder

For inquiries, please contact

中國礦產公司上海分公司

CHINA NATIONAL MINERALS CORP.
SHANGHAI BRANCH

16 Chung Shan Road E.1, Shanghai, China
Cable Address: "MINERALS" Shanghai

US RUBBER MATCHLESS CONVEYOR BELTING

over 10 long years—12 million long tons

AND STILL GOING STRONG!

The U.S. Matchless belt used in this iron mine is 2230 feet long, thirty inches wide. This style CX **USTEX-NYLON** *Conveyor Belt has a ¼" top cover and a 1/6" bottom cover.* **USTEX** *is a chemically and mechanically treated cotton, about 2½ times the strength of ordinary cotton.*

In March 1948, the first **USTEX-NYLON** Conveyor Belt ever used in an iron mine was installed in America. That was over 10 years, and over 12,000,000 long tons, ago.

Today, this belt is not only still performing up to expectation, but is actually hauling many more long tons per hour than when it was new.

Originally designed in two sections to carry 700 long tons, the belt was transferred, three years after its original installation, to another mine of the operating company—a mine that needed stepped-up production. There, these belts were spliced into a single length and instead of hauling 700 tons per hour, now carry up to 1100 tons per hour! And it's still going strong!

This patented **USTEX-NYLON** Conveyor Belt seems almost indestructible, even under the severe battering of iron ore. Made of **USTEX** for stamina and Nylon for flexibility, it has saved its owners a large sum in maintenance and replacement costs alone.

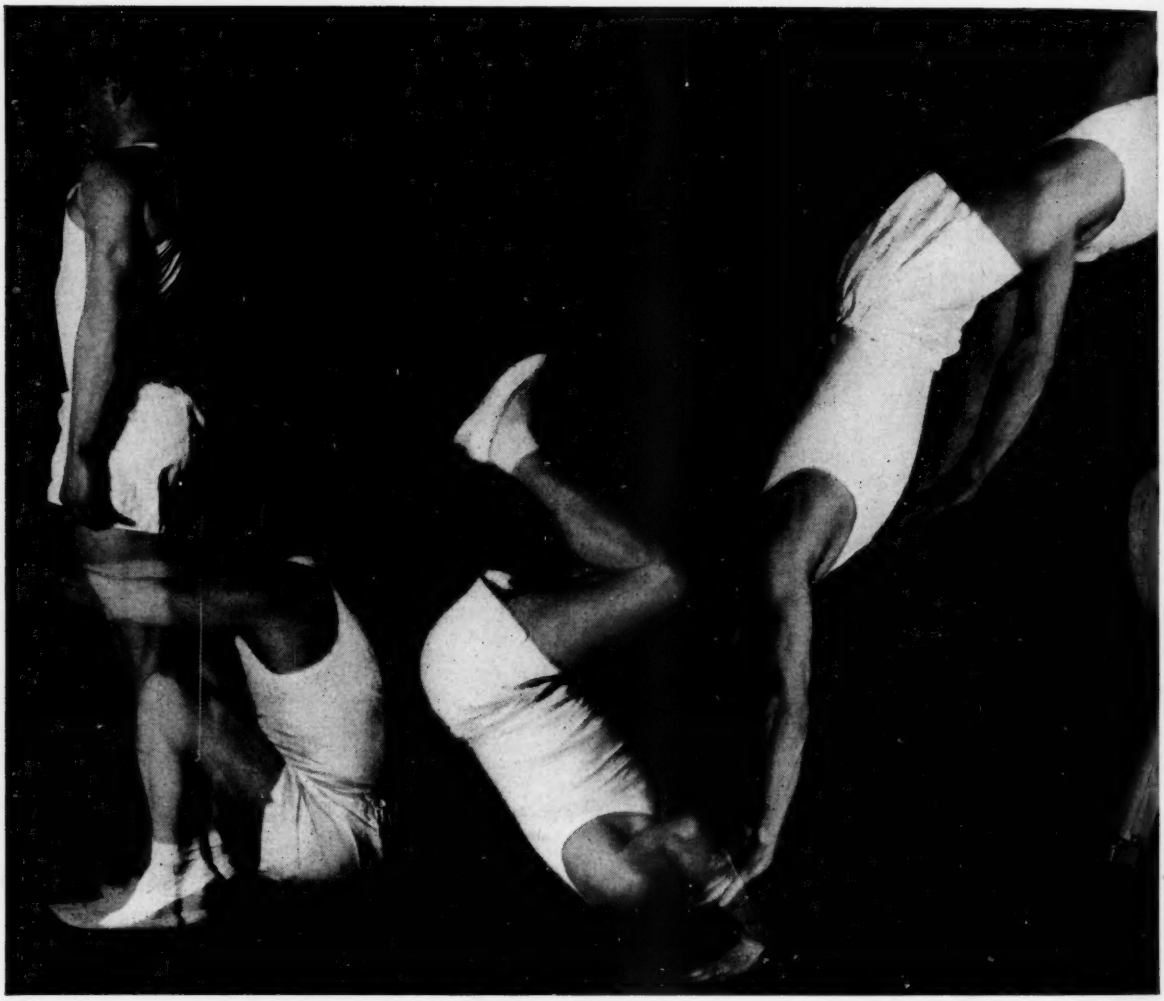
U.S. **USTEX-NYLON** Conveyor Belts are now available in Great Britain.

US RUBBER **U. S. Rubber**

Home: *The North British Rubber Company Limited.* | ABBey 5611
Export: *U.S. Rubber International (Great Britain) Ltd.*

62/64 HORSEFERRY ROAD, LONDON, S.W.1

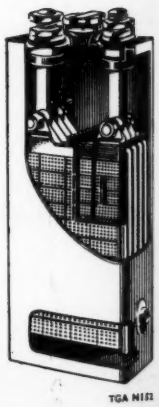
WORLD FAMOUS FOR: OIL, STEAM, AIR & WATER HOSE · POWERGRIP TIMING BELTS · DOCK FENDERS · EXPANSION JOINTS



RAPID RECOVERY

EVEN after periods of intense activity NIFE Steel Alkaline Batteries instantly recover their voltage and are ready for more work.
This is a tremendous advantage in switching, starting and emergency applications where batteries have to provide heavy discharges either simultaneously or in rapid succession.
NIFE batteries will hold their charge during long periods of inactivity. They do not deteriorate when standing by, but deliver full power whenever it is demanded.
High rates of charge and discharge will not harm them.
Since they need so little attention, and require no separate battery room, NIFE batteries reduce building, installation and maintenance costs.

Far-sighted engineers specify them for SWITCH CLOSING · SWITCH TRIPPING
EMERGENCY LIGHTING · STANDBY POWER FOR AUXILIARIES AND CONTROL CIRCUITS
PORTABLE SAFETY LAMPS · TELECOMMUNICATIONS



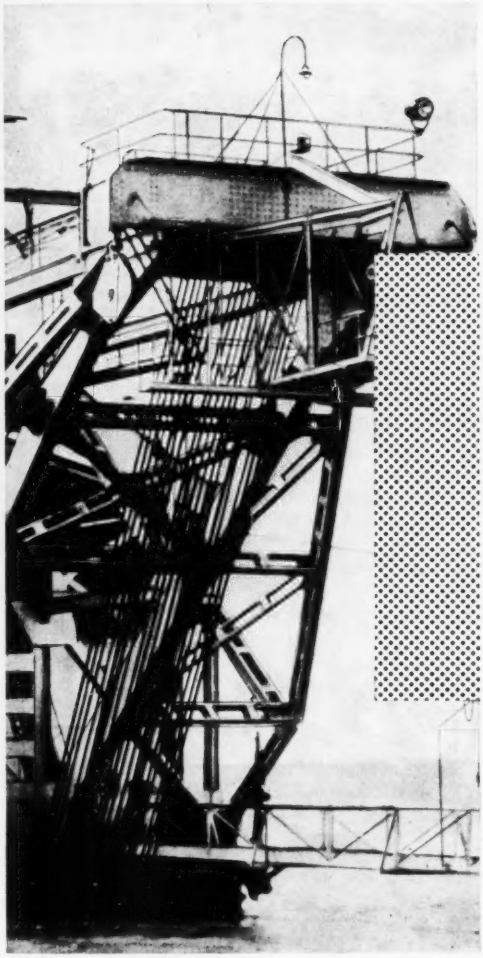
TGA NIFE

FIT FOR A LONG LIFE

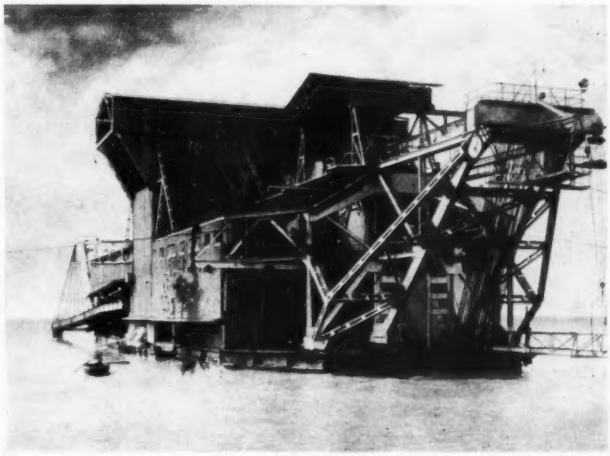
NIFE
STEEL ALKALINE BATTERIES

NIFE BATTERIES · REDDITCH · WORCESTERSHIRE

When you need dredgers, washing plant or other equipment..... think of I.H.C. Holland



Dredgers for mining alluvial ore-bearing layers or for clearing away sterile top soil, jigs and other washing plant, transporters of all types, materials handling plant - they are all regular items in I.H.C. Holland's building programme.



The success of all mining operations depends - in the long run - on the efficiency of the equipment used. I.H.C. Holland have a research laboratory, the Mineral Technological Institute, where soil-handling problems can be studied for you.

When you comtemplate modernization, think of I.H.C. Holland. Contact these specialists.

I.H.C. HOLLAND

SHIPBUILDERS AND ENGINEERS

2, VERLENGDE TOLWEG - THE HAGUE - HOLLAND

I.H.C. HOLLAND

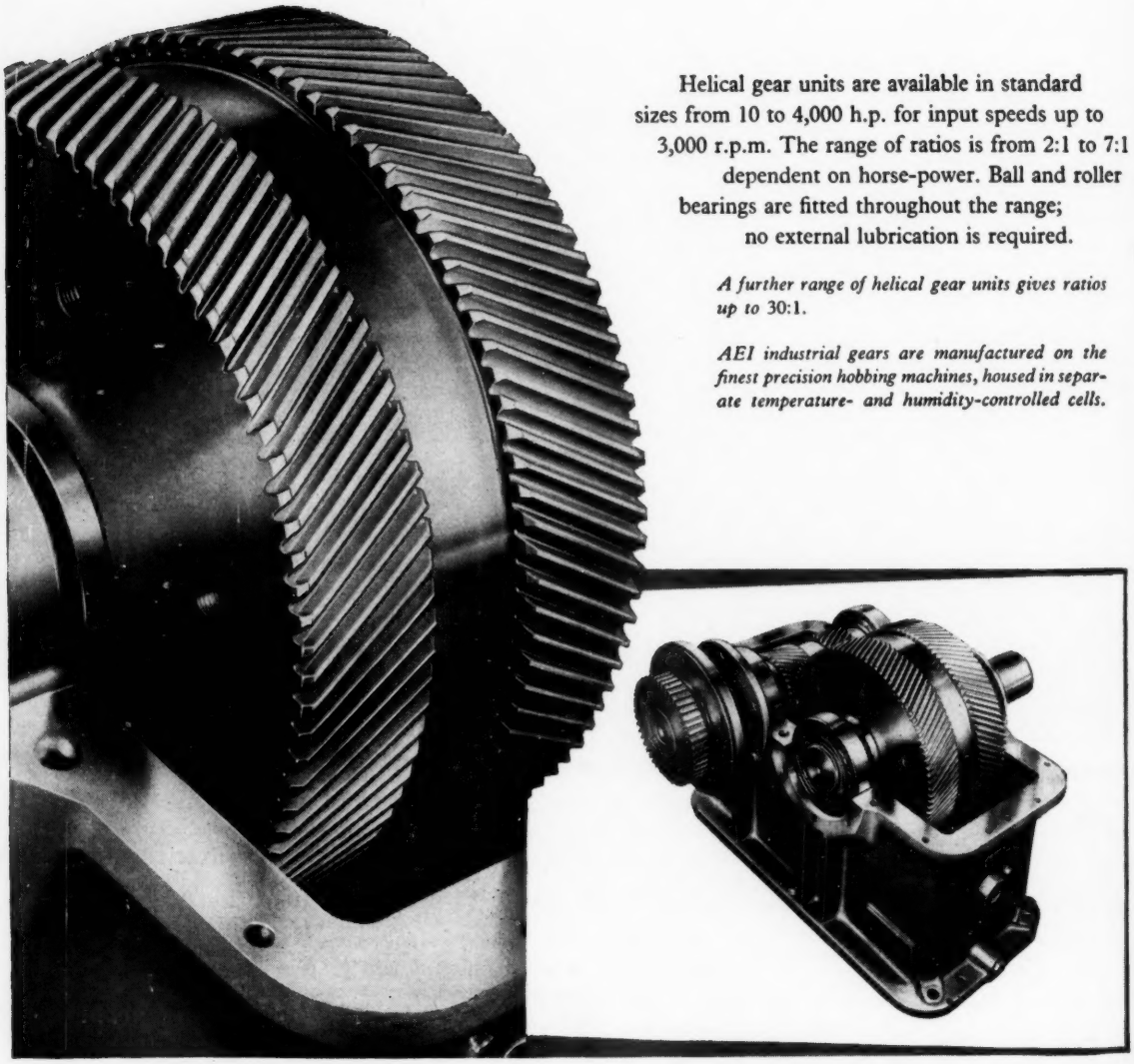
PARTNERS:
CONRAD-STORK
GUSTO
DE KLOP
J. & K. SMIT
L. SMIT & ZOON
VERSCHURE

Gink

Efficiency over 98%

with AEI

STANDARD INDUSTRIAL GEARBOXES



Helical gear units are available in standard sizes from 10 to 4,000 h.p. for input speeds up to 3,000 r.p.m. The range of ratios is from 2:1 to 7:1 dependent on horse-power. Ball and roller bearings are fitted throughout the range; no external lubrication is required.

A further range of helical gear units gives ratios up to 30:1.

AEI industrial gears are manufactured on the finest precision hobbing machines, housed in separate temperature- and humidity-controlled cells.

For further information and technical data please telephone Rugby 2121 ext. 108

ASSOCIATED ELECTRICAL INDUSTRIES LIMITED

HEAVY PLANT DIVISION. RUGBY, ENGLAND

A5380

The Mining Journal

London, August 26, 1960

In this issue . . .

Mining in the Development of the High Commission Territories	227
Canada's New Gold Producer	229
Mining Activity in the Belgian Congo ...	229
Canadian Mining Less Confident	229
The Cyprus Mining Industry in 1959 ...	230
Diamond Production in Yakutia	231
Graphite in Northern Rhodesia	232
Mining and Lining the Mindola Sub-Shaft	233
Machinery and Equipment	234
Technical Briefs	235
Mining Miscellany	236
Metals and Minerals	237
London Metal and Ore Prices	237
Mining Finance	239

Vol. 255 **No. 6523**

Established 1835

Editor
U. Baliol Scott
Deputy Editor
A. Graham Thomson

Assistant Editor
R. Bowran

Assistant Financial Editor
R. A. Nuttall

Display Advertisement Manager
E. S. Hooper

Circulation
Robert Budd

Published each Friday by
THE MINING JOURNAL LTD.

Directors
E. Baliol Scott (*Chairman*)
U. Baliol Scott (*Managing*)
G. A. Baliol Scott
R. A. Ellefsen

15 WILSON STREET, LONDON, E.C.2

Telegraphic Tutwork London
Telephone MONarch 2567 (3 lines)

Annual Subscription £3 10s. Single copy ninepence

Minerals in the Development of the High Commission Territories

IN JULY last year an Economic Survey Mission was appointed to conduct a general survey of the requirements and natural resources of the High Commission Territories of Basutoland, the Bechuanaland Protectorate and Swaziland, which are administered by the Colonial Office, and to make recommendations on the utilization of the financial resources that are, or might be, made available to these territories. Its findings are the subject of a report covering some 550 pages (H.M.S.O., 22s. 6d.), which contains practical recommendations for strengthening the economies of the three territories, together with estimated capital and recurrent costs. The natural resources of the three territories are surveyed and a number of possibilities for further exploitation of the known mineral deposits are discussed.

The most highly developed of the three territories is Swaziland, which has derived enormous benefits from its link with Turner and Newall, whose Havelock Mine in the Pigg's Peak area is one of the largest asbestos mines in the world. In 1957-58, asbestos accounted for more than half Swaziland's total exports, which amounted to £4,000,000.

Large reserves of iron ore of varying quality have been located in Swaziland, notably at Bomvu Ridge, where an estimate by the Geological Survey indicates 25,000,000 tons of haematite with an Fe content of 64.8 per cent, available by opencast working. There are further reserves which could be developed by normal mining methods.

Coal occurs in seams of mineable thickness on a line running roughly north to south on the eastern edge of the Lowveld. Of two deposits prospected in detail, the northern, near Stegi, is described as of anthracitic type. This seam has been investigated by Rand Mines Ltd., but is unlikely to be worked unless a rail link can be provided. In the south, near Maloma, Johannesburg Consolidated Investment have opened an incline to a seam of anthracite of high quality. In view of the continued demand for anthracite, the prospects of this mine are regarded as good, but here again, transport is an important consideration.

A re-survey of old gold workings in the Pigg's Peak area has produced encouraging results and the deposit, though probably of modest proportions, is likely to be exploited by the concessionaires in the near future. No other minerals are at present being mined in quantities having an appreciable effect on the country's revenue.

The Economic Survey Mission makes no detailed observations regarding the exploitation of Swaziland's mineral resources. Its report emphasizes, however, that minerals, once their exploitation has begun, are a wasting asset. This has two major implications. One is that the profits and taxes received from such exploitation should not wholly be treated as " income " but should be regarded to some extent as a " distribution of capital." The second implication

is that the government should ensure that a part of the gross value of mineral output is allocated and employed to create capital assets capable of maintaining the productive capacity of the economy after the mineral asset has been exhausted. The report suggests that this might be done by allocating an appropriate portion of the tax revenues received from the mining industry to a Development Fund, which could be used to develop such regenerating natural resources as water, or for the improvement of communications, educational facilities and public health services.

As a possible future project, the mission draws attention to the comparative economic advantages of producing steel as against exporting ore. There are extensive limestone deposits in Portuguese East Africa not far from the border. Though only a part of the Stegi coal deposits may perhaps be of coking quality, reports on the use of anthracite for smelting are encouraging. The ore is available, and at Bomvu Ridge at least, is of high quality. In the view of the mission the possibilities of steel manufacture should be examined. If the production of either steel or pig iron should prove to be economic, the chances that Swaziland's relatively extensive lower grade (or less accessible) ore deposits might be developed and utilized, would be much enhanced. For the time being, however, the great value of the iron ore deposits to the economy of the territory is that they might help to pay for the establishment of a railway connecting Bomvu with Goba. Mozambique has already carried its railway to Goba on the Swaziland border with the idea of linking up with a future Swaziland railway. Such a link would provide easy access with the port of Lourenco Marques. Eventually Swaziland might also be linked with the railway system of the Union. It is generally accepted that there is no alternative to rail for the transport of heavy minerals, and this view is held by the Swaziland Iron Ore Development Co., a subsidiary of Anglo American, who hold the prospecting concession for the deposits at Bomvu Ridge. A railway on the proposed alignment would also allow the development of the coal and anthracite mines, besides assisting the growth of secondary industries and agriculture.

Negotiations on the opening up of Swaziland's iron ore deposits and the construction of a railway line to link the deposits with Portuguese East Africa, are proceeding in London. The double project would probably involve a total investment of about £12,000,000. Anglo American has apparently decided that a tentative Japanese offer to buy the iron for 10 years is a not unreasonable proposition. The talks in London are concerned with raising the necessary finance for the project. Apart from Anglo American, the Colonial Development Corporation is involved in the negotiations, in which the British Government was reported to be showing considerable interest.

In Bechuanaland active mining is at present confined to asbestos and manganese (by the Marlime Co.) in the Bangwaketse Tribal Territory and manganese (by the Bechuanaland Protectorate Mining Corporation) in the Bamalete. Both companies are mechanizing and expanding their workings. The latter company expects a turnover of some £450,000 in 1960.

There are extensive brine deposits, with a high content of sodium carbonate and sodium bi-carbonate. It has been suggested that the brine from these deposits could be concentrated by solar evaporation in pans near Nata, whence the product could be transported by road or pumped along a pipeline (approximately 110 miles) to a refining plant on the railway line. Subject to further detailed investigation, the prospects of this proposal are regarded as encouraging. There are no salt supplies in the Central African Federation, which at present imports 35,000 tons per annum.

There are two main exploitable seams of coal in Bechuanaland—one at Mamabula, 35 miles south of Mahalapye and actually on the railway line, and the other further north and to the west of Palapye. Borings have proved very large reserves in both cases, but the seam at Mamabula, on account of its shallow depth and proximity to the railway, is the more readily exploitable. The coal lies in the Bamangwato Tribal Territory in the area under concession to the Rhodesian Selection Trust Exploration Ltd., who are at present considering the possibilities of its exploitation.

The coal is of good medium South Africa quality but could be sold outside the Protectorate only if it could be raised at such cheap rates that it would be competitive after benefication. The seams have little dip, and the method that suggests itself is opencast mining, which entails costly machinery and correspondingly heavy raisings. Cleaning by the medium cyclone system would produce 70 per cent of the coal raised in saleable form. It is suggested that a sustained demand for 500,000 tons per year would be the minimum which would justify opening a colliery of this type, the maximum output of which would be over 1,000,000 tons. Owing to the long hauls from Wankie and Witbank, the coal should be competitive as far north along the railway as Francistown and, if priced low enough, should also find a market in Mafeking and at points west of that town, including South West Africa. No market survey or investigation of coal users in these areas has yet been carried out.

The cost of opening a large opencast colliery might be £1,500,000 or more, and the high initial cost of such a project would automatically restrict the field of possible operators to the larger organizations. The mission suggests, however, that if an appreciable local demand could be established for run-of-mine coal, it would be practicable to mine this shallow, easily won seam on a small scale, using an incline, simple methods of extraction, and low capital investment. If no prospect of large-scale development emerges, these less ambitious possibilities should be examined.

These are the only mineral operations in Bechuanaland of any significance which are current or in immediate prospect. Much more active prospecting, however, is anticipated in the near future.

In Basutoland an agreement was entered into by the Paramount Chief in 1955 with Col. Jack Scott, in accordance with which the latter was allowed to prospect for and win diamonds, and a number of pipes and fissures of kimberlite have been located. The Basuto National Treasury is now deriving a modest revenue from Col. Scott. One such pipe at Kau has been in process of intensive investigation, but it has yet to be proved a commercially payable proposition. Col. Scott now proposes to carry out a systematic survey of Basutoland in his search for diamonds and it is expected that this survey will take three years. Financing has been arranged. The geologists engaged in this survey are required under the draft agreement to report indications of other minerals found during their work.

The mission strongly recommends that a Geological Survey team be sent to Basutoland to make a thorough exploration over a period of three to five years.

Basutoland's greatest potential asset is water. Three professional reports on its water resources have been made since 1951, all of which put forward proposals for the development of hydroelectric power on the Orange and/or Caledon rivers. One of these, known as the Ox-bow Scheme, is estimated to cost about £8,000,000 for a production of 387,000,000 kWh per annum. This scheme could supply pure drinking water to the Orange Free State and even as far as the Rand. If constructed as a combined scheme for delivering power to the border of Basutoland, and domestic and industrial water to the Western Free State goldfields, the total capital cost would be £8,900,000 in Basutoland and £7,200,000 in the Free State for the generation of 353,000,000 kWh per annum at a nett cost of 0.34d. per kWh and the delivery of 40,000,000 gallons/day at a cost of 10d. per gallon, these costs being exclusive of taxes, royalties and profits.

Such a scheme could be of great benefit not only to Basutoland but to the mines. Very careful investigation would be required, however, to determine the effects of the Ox-bow and similar schemes on the Orange and Caledon rivers, which are international, and the legal problems involved would have to be ironed out before construction commenced.

CANADA'S NEW GOLD PRODUCER

H. G. Young Mines, which started milling operations at the beginning of August as Red Lake's sixth producer, was the first new gold mine to enter the producing ranks in Canada in a long span of years. The last one that comes to mind was the Hugh-Pam in Porcupine, and it is significant that many of the same group are behind both companies.

To the people that brought in the H. G. Young mine, full credit must be given for their determination to launch a new producer despite the apathetic state of the industry as a whole, comments the *Northern Miner*, which also draws attention to the speed which has characterized the whole project. It is only two years since the capital was attracted to finance the underground programme. Since then the plant has been installed, the shaft sunk to over 1,000 ft., and the ore deposit opened. All this was accomplished at amazingly low cost, the mine reaching production for an expenditure of well under $1,500,000 including several hundred thousand supplied as a loan.

Ore is being trucked to the company's recently acquired Starratt mill, a distance of some 16 miles. While this has a capacity of close to 500 tons daily, present plans call for a 225-ton rate, which initially may be rather higher. Reserves to the 934-ft. level are calculated at 270,000 tons grading 0.31 oz. cut or 0.41 oz. uncut. Raises being driven on the various veins are showing some excellent ore.

The financing group included Broulan Reef Mines, Campbell Red Lake Mines, Moneta Porcupine Mines, Hugh-Pam Porcupine Mines, O'Brien Gold Mines, Mespi Mines and Nickel Offsets.

MINING ACTIVITY IN THE BELGIAN CONGO

The following survey of the situation in the Congo mines, seven weeks after Independence, has been received from our correspondent in Brussels.

Of 200 companies in operation before the disturbances, including textile and trading firms, 189 were still active on July 31. Of these, the white staff was in full strength in 130 cases and the Congolese staff in 143. The source of this information is the Féderation des Associations Provinciales des Entreprises du Congo Belge, who did not specify the number of mining companies included in the survey. It is believed, however, that the 200 firms include 35 mining companies, of whom 30 were still in operation at the middle of August. On December 31, 1959, the mining companies had a total of 87,213 employees, of whom nearly 80,000 were Congolese.

The mines of Union Minière were reported to be operating at almost full strength with 99 per cent of the white staff at their posts. Out of 165 white workers employed by the Société Minière du Bécéka at Bakwanga, Province of Kasai, 125 were left, but more were being sent to the Congo in order to bring the strength up to the original figure. Work was suspended for five days at Forminière and for 10 days at Tshikapa. At both Forminière and Minière du Bécéka disturbances were caused by tribal wars. Local government officials and heads of tribes are very friendly to Forminière, but a delegate of the Central Government, Mr. Joseph Ibutsi, cabled to Leopoldville recommending the expulsion of Forminière's management from Kasai. His action could scarcely have been more shortsighted, since the Congolese Government owns 55 per cent of Forminière's shares and the company employs nearly 20,000 Congolese.

The gold and tin mines of Cobelmin - Belgikaetain remained in full production, but activities were suspended at the Kilo-Moto gold mines. Symétain remained active. Operations were also suspended in the Tshela region and at Inga, but will be resumed.

All traffic to and from Union Minière is now routed through Lobito or Beira.

CANADIAN MINING LESS CONFIDENT

A mood of doubt has spread through the Canadian mining industry, reports the August issue of Barclays Bank D.C.O. *Overseas Review*. On looking at the industry it notes that one of Canada's famous gold mines, Hollinger Consolidated, reached its 50th year of life this June, with a record of having produced gold bullion valued at $500,000,000 having paid out $152,000,000 in dividends. But earlier this year, another of the famous gold mines of Ontario, Kerr Addison, caused sudden dismay by announcing that the end of its ore reserves was in sight. And late in July, a third, smaller gold mine announced it would go upon a salvage basis, being out of ore.

Gold production, in the first four months of this year, was slightly higher, at 1,503,127 f.oz., than in the similar period of 1959, and as the price of the United States dollar on which the price of gold in Canada is based, has been rising in this country, the return to the mines has been even greater. But the Bank reports that there is comparatively little interest in the search for new gold mines. Neither is there, now, the urgent interest in discovery of base metal ore bodies, even though total mining dividends to June this year, at $28,000,000, were 16 per cent higher than for the corresponding period of 1959.

Uranium mining exemplifies the first category. Up to mid-year, uranium exports—almost the whole of the production goes to the United States—were even with last year, at $26,000,000. Yet the United States decision, announced some time ago, not to take up future options has left the industry depressed and confused. More recent British announcement of a slowing down of atomic power development offset evidence that Canadian producers were getting costs down.

The passing pessimism also infected copper producers, despite a jump in value of exports to $92,000,000 for the first half of 1960 compared with $53,000,000 in the first half of 1959.

One further cause of doubt as to the international market was an effort by political interests in the United States to obtain a larger share of the lead - zinc market for marginal United States mines.

The mining industry also had had its enthusiasm for exploration and development reduced by domestic changes. The cost of mine operation has continued to mount, as miners' unions have become stronger and more inclined to strike. Stricter interpretation of taxable income has lessened the opportunity for promoters to make large tax-free capital gains.

Yet, while mining shares sag in the stock market and promoters talk pessimistically, there is healthy activity, both in the consolidation of interests to make stronger companies, and in exploration by large companies which are more businesslike and less spectacular. Most significant, substantial sums from seasoned overseas investors in mining exploration have been entering Canada.

The Cyprus Mining Industry in 1959

THE quantity of mineral products exported from Cyprus during 1959 was 1,171,330 tons as compared with 1,236,657 tons in the previous year, states the Inspector of Mines in his annual report for 1959. However, the higher prices received for copper products had the effect of increasing their total value from £9,124,250 to £9,477,243.

Competition in the pyrites industry became still more intensive, and some pyrite-producing mines suspended operations for a few months of the year. The strength of this competition, which started to become evident in 1958, can best be realized by comparing the quantity and value of the shipments of this ore during 1958 and 1959, which were 828,739 tons valued at £3,111,723 and 657,227 tons valued at £1,972,197 respectively.

The other principal products exported were 123,518 tons of cupreous concentrates valued at £3,969,840; 300,218 tons of cupreous pyrites valued at £1,939,872; 14,412 tons of asbestos valued at £856,942; and 3,693 tons of cement copper valued at £477,000. Exports of mineral products represented over 56 per cent of the total value of domestic exports.

Direct revenue from mining operations amounted to £66,849 compared with £66,782 in 1958, but the industry's main contribution is in the form of taxation on company profits. The estimated total expenditure by the major producers during 1959 amounted to £7,434,711, of which £6,299,677 was spent in the Colony.

The conditions prevailing in the island during the emergency deterred prospectors from operating in underdeveloped areas, but the emergency over, apart from increased prospecting activity, the major mining companies have undertaken some exploration in the mining lease areas.

Pyrite and Copper Operations

The programme of gaining re-entry into the sealed area of the pyrites orebody of the Skouriotissa Mine was continued by the *Cyprus Mines Corporation* until October, 1959, when it was suspended and the orebody resealed. The main rehabilitation programme concentrated on the ventilation system on three levels. In all 6,245 ft. of gallery were cleaned and made safe and new track, as well as air and water pipes, were installed. Two crosscuts were driven in ore to obtain samples for metallurgical tests.

At the Corporation's Apliki Mine 15 ft. crosscuts were driven during January and February for the purpose of taking metallurgical test samples. Apart from minor maintenance, the mine was closed for the remainder of the year.

The Mavrouni Mine operated for 288 working days on two shifts per day, and a total of 829,741 dry l.tons of ore, as compared with 817,710 tons during 1958, was mined and railed to the mill at Xeros.

The Hellenic Mining Co. Ltd., continued underground operations on its Kalavasos orebodies, and additional development was carried out; two new small orebodies were developed, while stoping continued at Mavri Sykia during the year. Petra mine was reopened towards the second half of the year, and some prospecting, by drilling, was carried out; a new orebody has been discovered on which prospecting work is being continued. A total of 163,443 tons of ore was mined; 248,217 tons were treated yielding 118,955 tons of marketable ore.

At the Kokkinopezoula mine, stripping and production continued in 1959, but mining came to a standstill early in the year due to lack of a market for the non-cupreous ore. Full production is again under way, but underground operations ceased when opencast operations began to affect underground mining.

At the new Agrokipic Mine, deevlopment work on the high grade section of the orebody continued and towards the end of the year stoping was started on the highest level. Prospecting is continuing both underground by driving and on the surface by drilling. Geophysical work, using the airborne electromagnetic method, was carried out, and additional drilling was commenced as part of the company's new drilling programme.

Lack of demand for non-cupreous pyrites had the effect of closing down the area comprising the Kambia-Sha Lease for most of the year. Work was nevertheless resumed towards the middle of the year. A new programme has been worked out and some drilling is due to start.

The total tonnage of pyrite exported by the Hellenic Mining Co. during 1959 amounted to 175,233 tons. At Karavostasi, on the north coast of the island, and adjacent to the Cyprus Mines Corporation, the installations were completed and it is anticipated that shipments of ore will be effected from this part during 1960.

At the Limni Mine of the *Cyprus Sulphur and Copper Co. Ltd.*, the production of cement copper which had started in May, 1958, continued until August, 1959, when the pumping of water for the launders had to stop, in view of the fact that mining operations recommenced in September; leaching is now confined to the precipitation of copper in the water draining from the mine.

Stripping of overburden at the Kinousa Opencast Mine continued up to July, when operations were suspended for the remainder of the year. From January to July 142,675 cu. yds. of overburden were removed, whilst mining operations were carried on from January to September; during this period 71,214 l.wet tons of an average assay of 0.88 per cent Cu. and 47.4 per cent S. were mined. At the end of January the concentration plant was closed down and modifications were carried out to enable the plant to treat the Limni slimes, which had been stockpiled during previous work on Limni ore, as these carried copper, gold and silver values. During September this plant was modified to treat ore from the Limni Mine and from October 1 to the end of the year Limni ore was milled.

Asbestos and Chrome

The use of rippers and heavy duty bulldozers by *Cyprus Asbestos Mines Ltd.* has practically eliminated the need for recourse to explosives. During the year 1,441,504 tons of rock were quarried, compared with 1,409,133 in 1958; 495,209 tons of raw material were treated. Production amounted to 7,450 tons of long grade and 5,428 tons of short grade fibres compared with 8,955 tons and 5,772 respectively in 1958.

Cyprus Chrome Co. Ltd. operated throughout the year without any serious stoppages and no difficulties were experienced after February with labour or supplies.

Diamond Production in Yakutia

This survey of the U.S.S.R.'s progress and problems in the development of the Yakutia diamond fields is based on reviews of recent Russian books in "Mineral Trade Notes", Vol. 50 No. 5

ONE of the objectives of the 1959-65 National Plan for the U.S.S.R. is the organization and expansion of diamond production in Yakutia. The Diamond Trust, the Yukatulmaz, was established in 1957, and exploitation of the Mir kimberlite pipe was begun the same year. This pipe is on the 114 E. Meridian between the Lena and the Vilyuy rivers. An open cut and two small beneficiation plants (based on the Mir) began operating in 1958. The planned output of diamond for 1965 is more than 16 times the output in 1958. However, the following problems must be surmounted before this goal can be attained :

(a) Technological processes, the scale of operations, and development priorities for different sources of diamonds must be determined;
(b) The best suited variant of the planned supply of energy for industry and housing must be chosen;
(c) Effective and planned transportation and communication with the rest of the country must be accomplished;
(d) Procurement of personnel, housing, and other related subjects must be solved;
(e) A means must be found to obtain fresh food for personnel.

The regional plan presupposes a full production capacity for the Mir pipe and for adjoining placers in the Irelekh river by the end of 1965 and a beginning of the exploitation of the Udachnaya pipe in 1970. The nearest large settlement, the Mukhtuya, is 260 km. south of the Mir; a road from Mukhtuya to Mir is under construction. At the Mir site there is an openpit, an underground mine, two small treatment plants, a diesel power station, a water reservoir on the Irelekh River, housing, schools and clubs. Mirnyy, a nearby settlement, has a population of about 10,000 which is expected to increase to 30,000 by 1965.

Planned capacity of the beneficiation plant, to be built by 1965, is several hundred tons of ore per day; the total volume of mining in 1965 will be about 70 times the volume mined in 1958. Mechanized equipment and an abundant supply of timber for mining and houses will be required. A cement plant, lime kilns, brick works, lumber mills, and other factories are to be built on the outskirts of the town. The Udachnaya pipe, 500 km. north of the Mir pipe, will be developed in 1970.

Development of a power supply is reported to be the most acute problem at the present time. A plan to build a thermoelectrical plant near Nyurba, in the centre of the Vilyuy Basin near large deposits of brown coal, was abandoned because of high losses and costs. An alternative plan to bring Ust'-Vilyuysk natural gas to Mirnyy was shelved. A decision was made in 1958 to complete a hydroelectrical power station to supply energy for the diamond districts and adjoining territories by 1964. Power will be supplied until 1964 by six "energy trains" on the banks of the Lena River at Mukhtuya. The Mukhtuya-Mirnyy power transmission line, now under construction, will be in service in 1960. Mirnyy and vicinity depend on 3 sovkhozes for food supplies (Lenskiy at Mukhtuya and El 'gyayskiy and Nyurba on the Vilyuy River; all were established in 1957).

Transportation problems are particularly acute owing to the absence of railways in Yakutia and to the remoteness of the diamond districts from navigable streams. The nearest entry to the districts is Port Osetrovo on the Lena River. This port has a branch railway line which is linked with the Siberian trunk line. Osetrovo is 2,661 km. from Mirnyy by one route and 1,212 km. by another, with estimated transportation costs of 449 and 340 rubles per ton of cargo, respectively. Other routes are in the planning stage. Newly designed 25 ton capacity aeroplanes capable of landing on short air strips (300 to 500 m.) may relieve the transportation problems in the future.

A new book entitled *Almaznye Mestorozhdeniya Yakutii (The Diamond Fields of Yakutia)* by A. P. Bobrievich, M. N. Bondarenko, M. A. Gnevuchev, L. M. Krasov, G. I. Smirnov, and R. K. Yurkevich has been published by Gosudarstvennoe Nauchno-Tekhnicheskoe Izdatel'stvo po Geologii i Okhrane Nedr (The Government Scientific-Technologic Publishing House for Geology and Conservation) Moskva, 1959, 527 pp. (33 figures; 116 tables; 337 references).

In contrast with earlier Russian reports on the diamond fields of Yakutia, this superbly written and illustrated book omits every possible direct indication that could be used in a quantitative appraisal of the diamond reserve or the grade of the ores. Of the more than 30 kimberlite pipes mentioned in the text and shown on the geologic maps, the presence of diamonds is mentioned only in three in the Mir (to be in full exploitation by 1965; the present mining is small scale), the Udachnaya (mining is planned to begin in 1970) and the Zarnitsa. The weight of diamonds and their numbers of values per unit of ore are given only in "arbitrary units". Diagrammatic representations of the ore bodies are given without scales. However, geological and mineralogical descriptions and chemical analyses of kimberlites from different pipes are reported in some detail.

Many of the kimberlite pipes of Western Yakutia contain few if any diamonds, similar to the South African diamond fields where only 1 pipe out of 20 or 40 is a diamond ore. The list of the known kimberlite pipes given in this book appears reasonably complete as of 1958, but further exploration for diamond in Yakutia is likely to disclose other deposits. From a practical point of view, the Mir and the Udachnaya will be the principal diamond producers in the U.S.S.R. within the next two decades. However, the possibility of additional discoveries in Yakutia and in North-Central Siberia must not be excluded from consideration. The extremely difficult terrain, climate, and high cost of exploration and development will make it impractical for the Soviet Government to change the present plans for the Mir and the Udachnaya pipes.

Climate and Terrain

The five areas of Western Yakutia, in which diamond lodes are reported, are between 58 deg. to 70 deg. (1,500 km.) and 110 deg. to 124 deg. E. (1,000 km.), in a poorly accessible country "devoid of roads suited for wheel traffic" with rivers only partially navigable and then only at flood time.

All of Western Yakutia is underlain by permafrost. Thickness of the permafrost in vicinities of the Mir kimberlite pipe is about 350 metres and is probably greater to the north. Thickness of the active layer varies from 1 to 2 metres, depending upon the vegetation and topography of the area.

The mean annual precipitation is from 21 cm. (Nyurba) to 29 cm. (Olenek), chiefly in July and August. Thickness of the snow cover, September to May, is not over 51 cm. The rivers freeze to the bottom in October and thaw in May. The spring floods are abundant but of short duration. There are minor floods in August caused by the rains. The winter climate is determined by the Siberian High and it is characteristically dry, sunny, and calm. Under such conditions the—40 deg. C. temperature is reasonably comfortable and excessively heavy clothing is not required.

The western part of the diamond region, as a whole, on the upper course of the Rivers Vilyuy, Morkoka, Markha, and the Olenek watershed, is a highly dissected hilly terrain with many flat top, mesa-like parcels of high ground. The altitudes of the higher plateau to the north do not exceed 900 metres. The eastern part of the region is a margin of the Vilyuy Lowland and is essentially a flat plain, The country is drained by rivers flowing through deep canyons.

Surface and underground drainage is controlled by permafrost and associated phenomena, with the resulting instability of the active layer. The country is water-logged over extensive areas, despite its arid climate. Saline soils and alkali soils are common on fluviatile terraces. Shallow immature humus-rich soils are characteristic of the country. The preponderant vegetation is the Dahurian larch (Larix dahurica)—a sparse forest of the tayga type with almost no undergrowth. Good timber is scarce, however, and is found, in quantity, only in the southern part of the country. The larch forest grades into tundra to the north.

Of the 483,000 inhabitants of Yakutia (1958), an autonomous part of the Russian Soviet Federal Socialists Republic with the territory 3,100,000 square kilometres (about the size of India), only a small fraction of the population live in the region of the diamond fields. Transportation to and from the fields is almost entirely by air.

The Mir Kimberlite Pipe

This pipe is in the valley of the Irelekh River and is cut by the Khabardin's Log (gulley). It is a funnel-shaped body, oval in its plane cross section, with the maximum cross-section area of about 120,000 square metres, about one-half of the cross section area of the Udachnaya and the Zarnitsa pipes; all others in the region are smaller, according to A. A. Gribin in the Gornyy Zhurnal, 1957 (11): 33-40. A new pipe, the Sputnik, was discovered near the Mir in 1959.

The walls of the Mir pipe dip 60 deg. to 75 deg. The pipe was explored by pits and tunnels to a depth of 20 m. and by exploratory drilling to depths of 100 to 400 m. on the grid, including one borehole down to 600 m. The Mir is reported to be the richest pipe in Yakutia and in the entire Siberian Platform.

The topmost 2.5 m. of the pipe is mostly a greenish yellow fine grained sand with clay, weathered kimberlite, and fragments of limestone and diabase. This horizon is underlain by a greenish blue and yellow loose and soft weathered kimberlite containing granules of pyrope, scales of chlorite, crystals of ilmenite, and magnetite, and, in places, of diamond visible to the naked eye. The loose horizon extends to about 6 m. in depth where it is succeeded by massive blocks of kimberlite grading into the monolithic rock.

Age of the kimberlite will be determined by further studies. Assuming its age to be Pre-Jurassic but Post Permian, one may be led to believe that its erosion surface is shallow, inasmuch as the productive and the tufogenic series in the district are relatively thin and could not have been thicker than 150 m. in the Pre-Jurassic time.

The previously indicated grade of the ore was 0.05 to 4 carats per ton (Gribin, op. cit.) with the reserves of industrial diamond "adequate" for the needs of the country. According to "The Diamond Fields of Yakutia", the diamonds from Mir, Udachnaya, and Zarnitsa average 10, 6.7, and 7.2 mg., respectively. The proportion of the diamonds weighing less than 4 mg. is one-third less in the Mir pipe than in the other two pipes, while the proportion in the 8 to 12 mg. size range is almost twice as high in the Mir pipe.

Diamond Drills

According to an article by B. I. Vozdvizhenskiy and M. N. Andreev, entitled "Teknika Gornorazvedochnykj Rabot" (Technology of Mining Exploration), published in *Izvestiya Vysshykh Uchebnykh Zavedniy (Bulletin of the Institutions of Higher Learning)*, 1958(1): 71-94, the designing of diamond drills by the Soviet engineers is progressing slowly and, depending on the progress of the diamond industry in the country, it will take several years to introduce modern diamond drills into mining practice The only drill now used in the U.S.S.R., the GP-1, is suited only for shallow drilling (100m.) and is obsolete.

GRAPHITE IN NORTHERN RHODESIA

The discovery, late in 1958, of deposits of graphite in the Eastern Province was followed up, states the Northern Rhodesia Department of Geological Survey in its report for 1959. The occurrence aroused interest overseas and a number of enquiries were received from London metal and mineral dealers.

These deposits occur in an area of 100 sq. miles lying south of the Great East road between Minga and Kawere, in the vicinity of the Mvuvye river. Nearly fifty occurrences of graphite bearing gneiss, granulite and calc-silicate rock were noted, while graphite in soils and float indicated even more widespread mineralization. Assay values of up to 16.7 per cent were recorded, but individual horizons of graphitic rocks proved to be not only impersistent but very variable in character.

Subsequent routine mapping demonstrated that the Mvuvye paragneisses, among which are included the graphite-bearing rocks, extend over an area greater than 350 sq. miles. This extensive outcrop, the concentration of graphitic rocks within it, the apparent good quality of the flake graphite, good access, and a plentiful supply of water and labour, would all assist development, but the cost of transportation to the coast, and a possible heterogeneity of the end product as the result of the working of occurrences of widely differing character, in addition to the variable nature of individual deposits, are inhibiting factors to be taken into account.

The deposits lie within the North Charterland Concession, over which Anglovaal Rhodesian Exploration Ltd., have the sole prospecting rights.

Mining and Lining the Mindola Sub-Shaft

To maintain continuity of production at Mindola Mine, N. Rhodesia, it became necessary to sink a sub-vertical shaft at a point approximately 2,200 feet on a bearing of 256° from No. 1 Shaft. The shaft will be sunk in three stages, each of which will bring in a further seven years' ore reserve. The first stage, which is to a depth of 1,690 feet below the 2,630 level, is scheduled for completion in 1964. The function of the shaft will be threefold, namely rock hoisting, introduction of fresh air into the workings below 2,880 ft. level, and transportation of men and materials. This article, condensed from Rhokana Review, *was written by D. Mytton, design engineer (mining), Mindola sub-vertical shaft project team*

TO satisfy the limiting conditions imposed upon the shaft in each of the functions listed, the following dimensions and capacities were considered adequate.

Shaft	25 ft. 6 in. dia., concrete lined.
Depth	1,690 ft. (ex friction winder) or 1,440 ft. (ex 2,880 level bank)
Cage capacity	180 men.
Skip capacity	15 tons (crushed rock — 6 in.).
Ventilation capacity	750,000 cu. ft. of air per min.

The rock hoist will be a tower mounted friction winder sited on the 2,630 ft. level. Though, the hoist had not yet been ordered at time of writing, its duty may be summarised as follows:

Vertical winding distance:

First stage	1,500 ft.
Second stage	2,540 ft.
Third stage	3,580 ft.

The shaft will be sunk using temporary hoists situated on the 2,630 ft. level, details of which are:

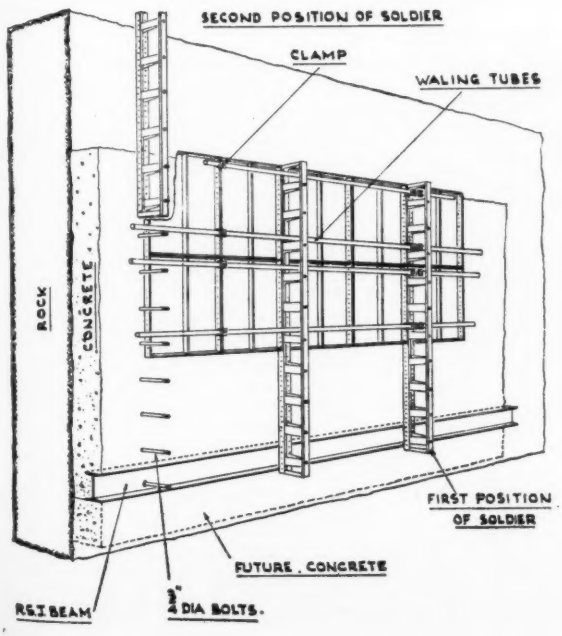
(a) 65 h.p. stage hoist.
Double drum A.C. hoist.

Drum size	8 ft. x 4 ft. 3 in.
Rope speed	17 ft.p.m.
Rope dia.	1¼ in.

(b) 750 h.p. service hoist.
Double drum A.C. hoist.

Drum size	10 ft. x 5 ft.
Rope speed	1,500 f.p.m.
Rope dia.	1¼ in.

The perspective view of shuttering technique. Metal framework was employed. By terminating the mining of the second stage at a point 70 ft. below the 2,630 ft. level only one sett of steel was available for concreting all four walls of the shaft. Hence the reason for regarding the man-sheave excavation almost as a separate entity



The routine adopted when mining and lining 2,630 ft. level to 2,880 ft. level was that, a 10 ft. dia. raise was developed by the cage raising method on the centre line of the proposed sub-vertical shaft from the 2,880 ft. level to the 2,630 ft. level. This holed the initial development of the friction winder excavation.

The friction winder excavation was then sliped to approximately its required plan dimensions but to only 14 ft. in height. In addition an excavation was mined to accommodate a 50 h.p. hoist whose function is to service the mining, lining and equipping of the headgear section. Thereafter, the shaft was shrunk to 27 ft. 6 ins. dia. from the 2,880 ft. level to a height of 140 ft. ex the 2,880 ft. level foot wall. Access to the face was effected by using the hoist mounted in the friction winder excavation on 2,630 ft. level.

Operations were switched to the 2,630 ft. level and the shaft was sliped down for a distance of 10 ft. On consolidation of the concrete collar, the shuttering was stripped and sliping continued down to a point 45 ft. below the 2,630 ft. level.

At this point a steel and timber bulkhead was installed on the 2,630 ft. level, incorporating the service bucket doors and the "suspension points" for the concreting stage. In addition the 50 h.p. winch was recommissioned in the excavation referred to in Stage 2, its headframe being mounted on the bulkhead steel. Sliping was continued to a point 70 ft. below the 2,630 ft. level. This embraced the remainder of the man-winder sheave excavation and the sheave slots.

The rectangular concreting stage was installed in the shaft, the actual erection taking place on the shaft bench. The stage was suspended from the 2,630 ft. level bulkhead by four 10 ton chain blocks attached to 1 in. wire rope slings, the lengths bearing according to the stage's position in the shaft. In this way the stage could be raised or lowered a distance of 20 ft. on the chain blocks before a change of slings became necessary.

As soon as the stage erection was completed, lining was started at a point 70 ft. below the 2,630 ft. level, but only on the south side of the shaft, thus embracing the entire man winder sheave excavation and the reinforced concrete beam which will support the crash beams. From this point to the base of the 2,630 ft. level shaft collar, lining was carried out concurrently on all four walls.

When the lining detailed for Stage 9 was completed, the sliping of the shaft continued until ultimately the rectangular section holed the circular section at a point 107 ft. below the 2,630 ft. level. During this stage of the mining the skip tipping point was excavated and about 10 ft. of the common pass established.

Concreting was started from the change of section—that is from circular to rectangular—and embraced all four sides of the shaft including such excavations at the tipping point and skip tipping recess.

Machinery and Equipment

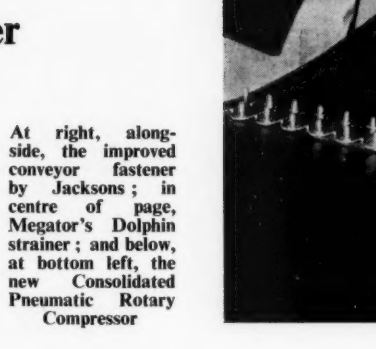
Improved Conveyor Belt Fastener

At right, alongside, the improved conveyor fastener by Jacksons; in centre of page, Megator's Dolphin strainer; and below, at bottom left, the new Consolidated Pneumatic Rotary Compressor

A simple improvement to the conventional plate type conveyor belt fastener is announced by Isaac Jackson & Sons (Fasteners) Ltd. The new fastener makes for easier fitting, is eminently suitable for use with impact tools, makes a stronger, more highly compressed joint, and reduces scraper problems.

The Isaac Jackson & Sons (Fasteners) Ltd. improvement involves turning the screw instead of the nut. High tensile, square ended screws are engaged by a turning tool. This tool is provided with an outer sleeve, having two lugs at the base, which serve to hold the nut in place whilst the screw itself is revolved in an anti-clockwise direction. By this method there is no danger of the tool slipping and application can be effected with absolute confidence under the most difficult conditions. The fasteners are compressed into the belt to an extent quite impossible with the old method, giving a splice of greater strength and considerably reducing scraper problems. The need for case-hardened nuts is entirely eliminated. The system is ideally suitable for operation with impact tools.

In conjunction with this new application method, the inventors have introduced a novel fixing jig which also acts as the template. By using this jig, all the fasteners required in the making of the splice are pre-set for application to each belt end, with a very considerable saving in operatives' time. It should be noted, however, that the use of this fixing jig is entirely optional.



FLOATING SUCTION STRAINER

A new floating suction strainer, for use with 6 in. hoses, has been added to the Dolphin range designed and manufactured by Megator Pumps & Compressors Ltd. The new strainer, the largest in the range, is capable of dealing with water flow at rates of up to 750 g.p.m. and is expected to considerably extend the field of applications. The main use up to present has been in dewatering mines and quarries and in sump emptying.

The new 6 in. version is intended for a wide variety of industrial uses, and the range now comprises five sizes of strainer, for use with 1½, 2, 3, 4, and 6 in. hoses. Water is drawn from just below the surface, so avoiding sand or silt from the bottom, and floating matter on the surface. Vortex formation is prevented, first by reason of the cylindrical disposition of the entry holes and secondly because any tendency to create a vortex is automatically countered by a slight sinking of the strainer.

The float chamber is filled with a moulding of expanded polystyrene foam, which provides millions of separate watertight air cells so that buoyancy cannot be lost as a result of accidental damage. The design ensures flotation in the correct posture, regardless of the twisting of the hose. Dolphin strainers are made entirely of plastics and austenitic stainless steel, so that they are virtually immune from corrosion.

NEW COMPRESSOR

A new oil flooded rotary Power Vane compressor of 260 c.f.m. at 100 p.s.i. capacity has been introduced by the Consolidated Pneumatic Tool Co. Ltd., A feature of this compressor is the new styling which has been adopted.

This new compressor has been introduced to meet the demand for a unit between the existing sizes of 210 and 365 c.f.m. and uses the power vane principle in which an eccentric rotor, equipped with sliding vanes is employed to compress air in a cylindrical chamber into which oil is pumped as a fine spray, the oil serving to lubricate and seal clearances and to cool the air at the time of compression. The 260-RO-2 is a two stage in line compressor, powered through a safety friction drive by a 6 cylinder Leyland U.E.375 diesel engine.

Technical Briefs

Siliceous Manganiferous Materials

Electric smelting tests were conducted at the Northwest Electrodevelopment Experiment Station of the U.S. Bureau of Mines, Albany, Oreg., to develop a feasible process for producing silicomanganese from siliceous manganiferous material. The Jackson County material used was massive and contained rhodonite as the most abundant mineral. Both raw and beneficiated materials were tested ; various proportions and types of fluxes and reductants were used to make up the furnace charges. The silicomanganese product was used successfully in manufacturing various steels at industrial plants.

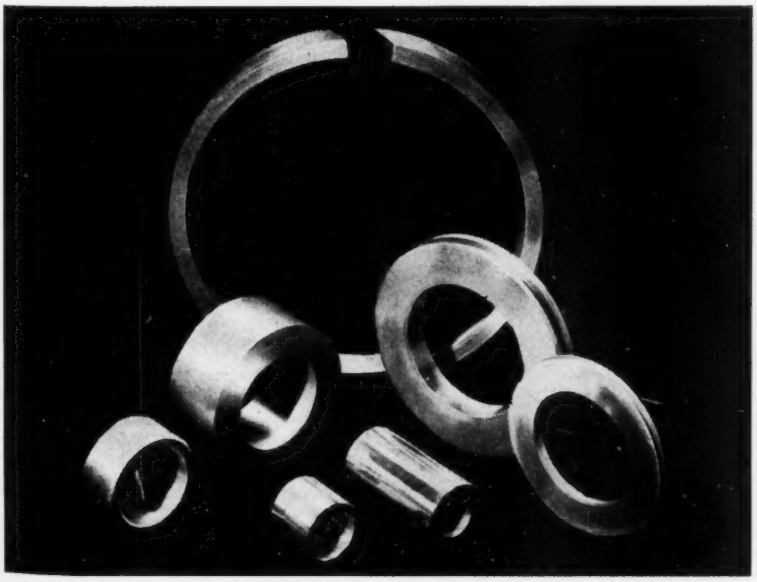
The manganese content of the samples ranged from 23 to 28 per cent ; silica plus alumina content was as high as 55 per cent—about four times the maximum specification for metallurgical grade ore. Sink-float laboratory tests indicated that the manganiferous material was amenable to benefication. Over 2 tons of rhodonite concentrate was prepared for smelting tests in a sink-float operation. Only the minus-¾-in., plus-8-mesh fraction was fed to a heavy-medium cone ; over 97 per cent of the manganese was recovered in the sink product, which contained 32.4 per cent manganese and 44 per cent silica plus alumina. About 25 per cent of the silica was removed in the float product.

Use of hogged fuel as all or the major portion of the reductant provided a bulky, porous, insulating charge, controlled the rate of ore entering the smelting zone, and helped attain adequate smelting temperatures. The manganese content of the silicomanganese produced from untreated rhodonite varied (in per cent) from 61.7 to 74.0 and in silicon from 13.5 to 24.9. In a few tests the analyses of the silicomanganese were within specifications for commercial grade : 65 to 68 per cent manganese, 18 to 20 per cent silicon, and less than 1.5 per cent carbon. The best manganese yields were obtained when the furnace charge contained enough lime or limestone to provide a slightly basic slag. The silicon content of the metal tended to increase when increased quantities of total reductant were employed.

Two furnaces of different sizes were used in these tests. Electrical energy consumption of the small furnace was as low as 5,345 kW.-hr. per ton of silicomanganese recovered from raw material when an offgrade alloy was produced ; it ranged from 8,954 to 10,220 kW.-hr. when alloys that met commercial specifications were produced. From 7,080 to 7,571 kw.-hr. of electrical energy was consumed when heavy-medium concentrates were smelted ; although the electrical energy consumption was fairly low, the silicon content of the metal was also relatively low—about 14.5 per cent.

In smelting the raw material in two large furnace tests, 5,790 and 6,215 kW.-hr. were used per ton of alloy produced. With the latter electrical energy consumption the silicon content (22.9 per cent) of the silicomanganese was above commercial specifications. Generally, the electrical energy consumption rises as the silicon content of the alloy increases. The experiments are described in U.S. Bureau of Mines *Report of Investigations* 5515.

Deva alloys, now being produced in this country, are claimed to combine the advantages of solid metal and solid graphite without possessing their extreme characteristics. They are described as being fully dense, homogeneous solids, having properties which permit the exceeding of service limitations of existing self lubricating materials and are also easily machinable. Deva metal is used for all bearings which must not be lubricated because Deva bearings have a dependable self lubricating action. The graphite lubricating film formed on the contacting surface cannot dry up or flow off during long periods of inaction, as usually happens with oil or grease lubricants. This graphite film is quite permanent and it provides the neccessary lubrication right from the start. Thus Deva metal bearings eliminate the risks of seizure and of wear of costly contacting materials. Deva metal is manufactured by The Universal Metallic Packing Co. Ltd.



NEW PROCESSES FOR MINERAL DRESSING

A three-year programme of work on an ion exchange method for recovering gold from cyanide liquors is being supported by the National Research Development Corporation at Teddington. Compared with the conventional precipitation by zinc, an ion exchange method has advantages in that it can be used to deal with solutions containing relatively large amounts of copper or nickel, it tends to yield a higher purity gold, it makes it possible to recover the metals such as nickel, cobalt or even copper, it gives a potentially higher recovery of the gold and lastly, combined with a resin-in-pulp technique, it may be possible to eliminate the solid-liquid separation step.

A novel method for upgrading rock salt has been developed by International Salt Co., in the U.S., which appears to be not only a practical one, but has been used on a commercial scale at the company's mine in Detroit.

The process consists of two main steps. First the crude rock salt is exposed to radiant heat when the pure salt crystals remain relatively cool whilst the impure crystals are selectively heated, since they fail to transmit the heat as effectively. After passing through this heat treatment, the crude rock is deposited on a high speed conveyor belt which is coated with a heat sensitive resin. The pure crystals are discharged over a tail-pulley but the impure fragments adhere to the belt somewhat longer and consequently their trajectory is different.

Pohl and Plymate of Princetown University plastics laboratory have devised the isomotive cell, which makes use of dielectric polarization for effective particle separation. The operation consists of passing the finely divided material through a pair of diverging electrodes in a dielectric liquid, while the particles pass down a tilted tray.

The ability of the apparatus to separate materials of closely similar dielectric constant has been demonstrated using alumina and fluorite with dielectric constants of 8.5 and 6.9 respectively and it would appear to offer possibilities for commercial application.

FLAKED LONG CHAIN AMINES

Long chain amines such as Armeen HT (made from hydrogenated tallow), Armeen 18 (pure octadecyl amine) and other amines, together with their acetate salts, have melting points in the region of 55 deg. C. which make them difficult to empty from drums. In many cases, to facilitate removal from the drum, the material has to be melted, an expensive and awkward operation.

Armour Hess Chemicals Ltd. now supply these chemicals in flaked form. They are packed in 100 lb. net fibre kegs, are free flowing, and easily handled, which is of particular advantage where these cationic surface active chemicals are used in water treatment, in the flotation of ores, in fact wherever accurate dosing in small amounts is necessary.

MINING MISCELLANY

Large new deposits of salt have been discovered in the Cheshire Basin as the result of deep boring by the Geological Survey of Great Britain. The boring operations—including one borehole to a depth of slightly more than 5,500 ft., have revealed reserves of salt estimated at about 400,000,000,000 tons.

★

It is reported from Canada that the Dowa Mining Co., of Japan, is interested in a copper and iron property in British Columbia, and that Sumitomo Shoji, which has opened a Vancouver office, is considering a shale deposit on Vancouver Island.

★

Semi-finished rolled steel products are now being produced at the Durgapur Steelworks. Stages I and II are completed, and the remaining stages will be completed during the first half of 1961. When finished rolled steel products will come into production. By the end of June, 1960, approximately 95 per cent of the plant and equipment supplied from the U.K., amounting to about 243,000 tons, had been shipped. During the previous 15 months plant had been leaving the U.K. ports for Calcutta with a maximum rate of approximately 16,000 tons a month during peak months. Civil engineering and erection of structural steelwork is nearing completion and work is now proceeding on the erection of mechanical and electrical plant and equipment.

In the first quarter of 1960, Tunisian production of phosphates amounted to 553,200 tonnes, compared with 479,915 tonnes in the same period of 1959, of which 465,200 tonnes (385,409) were exported; iron ore amounted to 272,800 tonnes (222,371), and 319,900 (213,166) were exported; lead ore production was 6,743 tonnes (7,718) and zinc ore 1,756 tonnes (1,780).

★

Recent finds of asbestos and chromite deposits in North Borneo are being investigated.

★

The Liberian American-Swedish Minerals Co. (LAMCO) has granted a contract, said to be worth about $40,000,000, to Raymond International Liberia, for the construction of the railway from the iron ore concession in the Nimba Mountains to the coast, and for a port at Buchanan. The Liberian German Mining Co. (DELIMCO) announce their intention of starting work on their iron ore concession in the Bong Hills. A railway from the concession area to the port of Monrovia, and a new wharf and loading facilities will be needed there. The National Iron Ore Co., under the management of Mines Management Associates, are progressing with their railway from the iron ore concession near the Sierra Leone border to the existing Liberian Mining Co.'s railway at Bomi Hills. Dredging has started in the port of Monrovia to allow the construction of a wharf and loading facilities for the National Iron Ore Co.

An agreement is reported whereby the Soviet Union will supply equipment worth £E1,500,000 to Egypt for prospecting in the Eastern Desert for iron ore, copper, lead, zinc, chrome, manganese, sulphur, phosphate and coal. Deposits of aluminium clays are reported to have been discovered at Aswan, with low mineral content.

★

British Newfoundland Corporation states in its annual report that work has started on the 120,000 h.p. hydro-electric project at Twin Falls, Labrador. It is estimated that the project will cost up to $30,000,000. Iron Ore of Canada and Wabush Iron are expected to take delivery from the site by June, 1962, and January, 1965, respectively. British Newfoundland still has between 4,000,000 and 6,000,000 h.p. available on the Hamilton River.

★

The Eire Minister for Industry and Commerce has granted a prospecting licence to Bonmahon Copper Mines of Dublin for an area of 5 sq. miles in south County Waterford, covering the old copper mines at Bonmahon. The geological engineer who has been surveying the area stated that the company were to undertake test bores, but that although results to date had been encouraging, the mine shafts were heavily flooded. Several unsuccessful attempts have been made to re-open these mines in the past 60 years, since good quality copper had previously been obtained there.

★

Barclays Bank D.C.O. reports from Freetown that the Diamond Corporation (Sierra Leone) is to prospect for gold and platinum under an agreement signed with the government, allowing the Corporation to investigate deposits of diamonds which might still exist in the disused swamps and terrace gravels outside the Sierra Leone Selection Trust lease areas. The Bank adds that the Corporation will, in the first instance, assist the government's mining and geological departments in prospecting works in different parts of the country. The Corporation will be permitted to mine gold and platinum, if economic deposits are found, but not diamonds. Any diamonds recovered during prospecting must be sold through the Government Diamond Office, proceeds of sale being refunded to the Diamond Corporation up to the amount of their expenses.

★

Coal production in Portugal fell by 15 per cent during the first quarter of 1960 from 181,000 tonnes to 153,000 tons, compared with the same period in 1959. Iron production was steady at 46,000 tonnes, and tin, gold and silver outputs were lower. Wolfram production increased from 362 tons to 561 tons, and the sale price realized by the wolfram mines increased from £90,000 to £255,000.

★

The recently published Annual Report of the Mineworkers' Pension Scheme gives a membership figure of 96 per cent, compared with 92 per cent in the previous year. During the year members' contributions amounted to £2,106,622, and National Coal Board contributions to £2,893,994.

The ore-exporting town of Lulea, on the coast of the Gulf of Bothnia, is the site of the world's first drive-in exhibition mine, presented by the Swedish mining company, Luossavaara-Kiirunavaara AB(LKAB). LKAB are to build a new ore port at Lulea, at a cost of Sw.Cr.150,000,000, which will, on completion in 1964, be capable of handling shipments of up to 8,000,000 tons of iron ore per year. Illustration shows a Joy Drillmobil DM-2 at the exhibition

Metals and Minerals

The U.S. Lead-Zinc Aid Bills

Determined efforts are being made by U.S. mining interests to push through legislation to assist domestic lead and zinc producers. Two separate objectives are being pursued, one being to secure higher import duties and the other to secure support for small U.S. lead and zinc mines.

A bill approved by the Senate Finance Committee would almost double existing U.S. tariffs on these two metals, besides instituting additional tariffs if prices fell below 13.5 c. a lb. for lead and 12.5 c. for zinc. This measure was approved by the Senate Finance Committee in June and was reported to the House of Representatives by the Ways and Means Committee on August 17. A separate tariff Bill is under consideration in the House, which is less well disposed towards mining interests. Since either of these Bills, if it passed both Houses of Congress, would almost certainly be vetoed by the President on the advice of the Administration, lead-zinc tariff legislation has also been added as a rider to a Bill originally concerned with taxes in the Virgin Islands, on the principle that it would be more difficult for President Eisenhower to veto proposals tacked on to an entirely different Bill.

This week the Senate has passed and sent to the White House a Bill to grant Federal subsidies to small lead and zinc producers. The measure provides for nearly $5,000,000 a year to be handed out to small lead and zinc producers by the Interior Department. The subsidy payments are designed to give the producers a return equal to what they would receive if the market price for zinc were 14½ c. a lb. and for lead 17 c. a lb. Current lead and zinc prices are below this level. A small domestic producer is defined as one who would apply for subsidies on not more than 2,000 tons of lead and/or 2,000 tons of zinc a year. (See also page 238.) In its original form the Bill would have subsidized much higher outputs, but the Administration opposed the measure before Congressional committees and persuaded Congressmen to reduce its scope.

This Bill is regarded by its sponsors, mainly Western State Congressmen, as almost the last attempt at this session of Congress to bring relief to lead and zinc producers. However, should President Eisenhower veto the subsidies, these Congressmen are expected to try to override the veto. It is also understood that, if the veto were sustained, they would be ready to push the Senate Bill providing for the sharply increased tariffs on imported lead and zinc ores.

A decision on whether or not to veto the subsidies Bill might be a difficult one in an election year. So far as exporting countries are concerned, subsidies for small domestic producers are obviously a horse of a very different colour to the proposed increases in tariffs. It is reassuring, therefore, that high Administration officials remain fully confident that legislation providing for tariff increases would be vetoed.

HIGH PURITY METALS

Johnson, Matthey and Co. Ltd., are now producing very pure arsenic, antimony, tellurium and bismuth on a commercial scale.

By means of newly developed techniques, arsenic is being produced with an impurity level of the order of 1 p.p.m., detected by the use of present known and accepted spectographic methods. The element is in the form of crystalline lumps and is packed in vacuum-sealed glass tubes.

Antimony, with a maximum metallic impurity content of 5 p.p.m., and bismuth, with a maximum level of metallic impurities of 10 p.p.m., are being produced in ingot form. Zone-refined tellurium, with a metallic impurity content of the order of 1 p.p.m., is also available in bulk, in the forms of ingot or grain.

Of increasing importance to the semiconductor industry, these four high purity metals find growing application in the form of inter-metallic compounds. For example, gallium arsenide is used in the production of special diodes and transistors, indium antimonide and indium arsenide are used for magnetosensitive devices, and bismuth telluride is used in Peltier cooling units.

QUICKSILVER PRICE OUTLOOK

The range of quicksilver prices has narrowed to £69 15s.-£70 per flask ex-warehouse London, compared with £69 15s.-£70 5s. previously. Buying interest in the U.K. is still seasonably quiet, but on the Continent and further afield it is being satisfactorily maintained.

In the U.S. record amounts of quicksilver are going into missiles and industrial controls, as well as other uses. At the same time import supplies are tightening, and it is believed that the output of domestic mines will not exceed 25,000 flasks this year, nearly 6,000 less than in 1959. In all these circumstances quicksilver's decline appears to be nearing its end, and it seems probable that the price will soon climb above its present level of $208 - $211 f.o.b. New York, which is roughly $20 lower than last year.

ANTIMONY CONSUMPTION RISES

Further evidence of the rising trend in antimony consumption is afforded by the latest figures issued by the British Bureau of Non-ferrous Metal Statistics. Total consumption of antimony metal and compounds in the U.K. during the first six months of 1960 rose to 3,043 l.tons, as compared with 2,336 tons in the corresponding period of last year. By far the largest gain was recorded for batteries, the figures for the two periods being 1,012 and 572 l.tons. At 494 tons June consumption was lower than the 576 tons recorded in May, but consumption of antimony in scrap rose to 561 tons from 538 tons in May.

There has also been a very marked increase in the consumption and uses of

LONDON METAL AND ORE PRICES, AUGUST 25, 1960

METAL PRICES

Aluminium, 99.5%, £186 per ton
Antimony—
English (99%) delivered, 10 cwt. and over £190 per ton
Arsenic, £400 per ton
Bismuth (min. 1 ton lots) 16s. lb. nom.
Cadmium 10s. 6d. lb.
Cerium (99%) net, £15 0s. lb. delivered U.K.
Chromium, Cr. 99% 6s. 11d./7s. 4d. lb.
Cobalt. 12s. lb.
Germanium, 99.99%, Ge. kilo lots 2s. 5d. per gram
Gold, 250s. 2d
Iridium, £20/£23 oz. nom.
Lanthanum (98%/99%) 15s. per gram.
Magnesium, 2s. 2¼d./2s. 3d. lb.
Manganese Metal (96%/98%) £275/£285
Nickel, 99.5% (home trade) £600 per ton
Osmium, £18/£22 oz. nom.
Osmiridium, nom.
Palladium, Imported, £8 12s. 6d.
Platinum U.K. and Empire Refined £30 5s.
Imported £28¼/28¾
Quicksilver, £69½/£70 ex-warehouse
Rhodium, £43/£45 oz.
Ruthenium, £14/£16 oz. nom.
Selenium, 50s. 0d. per lb.
Silver, 79¼d. f. oz. spot and 79¼d. f'd
Tellurium, 25s. 0d. lb.

ORES AND OXIDES

Antimony Ore (60%) basis			20s. 6d./21s. 6d. per unit, c.i.f.
Beryl (min. 10 per cent BeO)			240s./245s. per l. ton unit BeO
Bismuth			65% 8s. 6d. lb. c.i.f.
			18/20% 1s. 3d. lb. c.i.f.
Chrome Ore—			
Rhodesian Metallurgical (semifriable 48%)	(Ratio 3 : 1)		£15 5s. 0d. per ton c.i.f.
" Hard Lumpy 45%	(Ratio 3 : 1)		£15 10s. 0d. per ton c.i.f.
" Refractory 40%			£11 0s. 0d. per ton c.i.f.
" Smalls 44%	(Ratio 3 : 1)		£13 5s. 0d. per ton c.i.f.
Baluchistan 48%	(Ratio 3 : 1)		£11 15s. 0d. per ton f.o.b.
Columbite, Nigerian quality, basis 70% combined pentoxides (Ratio 10 : 1)			
	Nb_2O_5 : Ta_2O_5		180s./185s. per l. ton unit c.i.f.
Fluorspar—			
Acid Grade, Flotated Material			£22 13s. 3d. per ton ex. works
Metallurgical (75/80% CaF_2)			156s. 0d. ex. works
Lithium Ore—			
Petalite min. 3½% Li_2O			50s. 0d./55s. 0d. per unit f.o.b. Beira
Lepidolite min. 3½% Li_2O			50s. 0d./55s. 0d. per unit f.o.b. Beira
Amblygonite basis 7% Li_2O			75s/85s. per ton f.o.b Beira
Magnesite, ground calcined			£28 0s./£30 0s. d/d
Magnesite Raw (ground)			£21 0s./£23 0s. d/d
Manganese Ore Indian—			
Europe (46%-48%) basis 67s. 6d. freight			73d./75d. c.i.f. nom.
Manganese Ore (43%-45%)			69d./71d. c.i.f. nom.
Manganese Ore (38%-40%)			nom.
Molybdenite (85%) basis			8s. 11d. per lb. (f.o.b.)
Titanium Ore—			
Rutile 95/97% TiO_2 (prompt delivery)			£28 0s. 0d. per ton c.i.f. Aust'n
Ilmenite 50/52% TiO_2			£11 10s. per ton c.i.f. Malayan
Wolfram and Scheelite (65%)			155s./160s. per unit c.i.f.
Vanadium—			
Fused oxide 95% V_2O_5			8s./8s. 11d. per lb. V_2O_5 c.i.f.
Zircon Sand (Australian) 65-66% ZrO_2			£16/£16 10s. ton c.i.f.

cadmium in the U.K., the total for January-June, 1960, amounting to 682.10 l.tons compared with 505 tons in the corresponding period of last year. In June, 1960, consumption totalled 122.55 l. tons.

RUSSIAN WOLFRAM SALE

The London wolfram ore shipment price is currently indicated from 155s. to 160s. per l.ton unit c.i.f. Europe, being a fall of 2s. from our last week's quotation. This fall was rather unexpected, since demand was beginning to show signs of reviving, and is attributed to a further sale of Russian metal, which is reported to have changed hands at about 5s. per ton below recognized prices. It is significant, however, that the latest sale, involving about 20 tons which was already in the hands of European dealers, has had far less effect on prices than reports of similar deals earlier this year. During March and April some 400 tons of Russian wolfram changed hands at about 10s. below the prices then current.

There appears to be no reason to anticipate more sales of Russian metal in the near future. Assuming the absence of further large offerings from Russia or China, supply and demand are expected to remain in fairly good balance, with the possibility that prices might tend to edge higher in the autumn under the stimulus of Japanese demand. The Japanese Government has recently allocated foreign currency for the purchase of 1,000 tons of wolfram, to be imported between October and March.

SYNTHETIC DIAMOND PATENTS

A report from New York states that the General Electric Co. has been granted patents on the process and apparatus for making synthetic diamonds. The patents, issued by the U.S. Patent Office, cover the "basic" high-pressure equipment used in making the stones in addition to later improvements in the equipment.

COPPER · TIN · LEAD · ZINC

(From Our London Metal Exchange Correspondent)

There has been further evidence of the return to work after the holiday shutdown in the U.K. and interest in the market has widened. It must, however, be remembered that a considerable proportion of Continental works are still on holiday. Prices of the four metals on the London Metal Exchange have shown different tendencies and no post-holiday pattern has yet established itself except that the tin price seems to be set for a further recovery, whilst the lead and zinc prices are likely to remain at or below the present level.

COPPER MOVING UP AND DOWN

The copper market has been active and after prices rose at the end of last week there was a sharp fall again on Monday morning, but this was recovered on Tuesday due to heavy buying of cash metal in the morning. This proved short-lived as when the demand dried up prices fell back sharply.

The demand has originated from Europe, the Iron Curtain countries and Japan and has done much to balance the very disappointing news from the U.S. where there appears to be no signs of any upturn and although the official customs smelter price remains at 33 c. per lb. it is understood that copper is changing hands at appreciably below this figure. In Chile, Anaconda and the Mine Unions are in direct negotiations and more optimistic members of the trade are now saying that there may not be a strike at the Chuquicamata mine at the end of September after all, in which case lower prices can be expected. The situation in the Congo remains as imponderable as ever but it appears that the copper is still being produced and that the movement of the metal has not been impeded to any extent. Opinion amongst dealers is almost equally divided as to the probable course of the copper price and until the situation becomes clearer the market is likely to move in accordance with day-to-day factors.

TIN'S SHARP RECOVERY

The tin market has recovered sharply from the low point established last week and it is expected that this recovery will continue as the Meeting of the International Tin Council, which is to take place this week, is unlikely to make any alteration in quotas. Demand on both sides of the Atlantic has picked up considerably and it is expected that the autumn buying campaign has now started.

On Thursday the Eastern price was equivalent to £810½ per ton c.i.f. Europe.

WEAK LEAD-ZINC UNDERTONE

Lead and zinc have both developed a weak undertone. In the lead market there has been a growing realization that stocks are piling up in producers' hands and that some alteration will have to be made to the present 10 per cent cutback if forecasts of consumption do not envisage a considerable improvement. The general impression is that no action will be taken during the next meeting of the study group in Geneva in the middle of September but there are a few pessimists who consider that the outlook is such that the 10 per cent holdback will have to be given up but that some satisfactory policy on the release of the stocks at present held will be arrived at.

The zinc market has been largely affected by the extreme dullness of demand in the U.S. which is resulting in the flow of a certain tonnage of metal from the western hemisphere to the market and as the supply situation in Europe is now satisfactory this is having a depressing effect on prices. If it was not for the continuing strikes in the U.S. which were mentioned last week, the position might be considerably worse and the 13 c. per lb. price might even be in danger. In the U.S. the Senate have now sent to the President the Bill designed to support the small producers but it is by no means certain whether this will receive Presidential approval or not: the Bill calls for a subsidy payment to mines producing less than 2,000 tons of lead and/or zinc in a year—to bring the price received up to 14½ c. per lb. for zinc and 17 c. per lb. for lead—this is another example of the perpetuation of the old idea that the lead price should be above that of zinc.

U.K. JUNE STATISTICS

The British Bureau of Non-ferrous Metals have published the U.K. statistics for June and the salient figures are given below with the comparative May figures in parentheses (in tons):

Consumption of copper totalled 65,398 (63,659).

Exports and re-exports increased sharply with more metal going to Czechoslovakia, Hungary and the U.S.S.R. and with India also figuring more prominently.

Stocks of refined and blister copper at the end of June amounted to 71,391 (77,808); lead consumption amounted to 33,318 (33,459); stocks at the end of the month amounted to 46,542 (45,657).

Once more there were fairly heavy arrivals of Spanish lead during the month.

Offtake of zinc totalled 33,058 (31,066); stocks at the end of the month were 52,004 (52,470).

Exports and re-exports rose sharply, the figure of interest being 630 tons to Australia. There was also some shipments to Western Germany.

Usage of tin 2,133 (1,902); end of month stocks totalled 11,113 (10,565).

The continuation in the consumption of copper is underlined by the fact that offtake for the first six months of 1960 amounts to 374,620 tons against a total figure for 1959 of 633,166 tons. In lead the increase is not so marked but a first six-months figure of 191,977 tons compares with a figure for the whole of 1959 of 345,803 tons. The same figures for zinc are 188,578 tons for the first half of this year, against 335,890 tons for the whole of 1959.

Closing prices are as follows:

	August 18		August 25	
	Buyers	*Sellers*	*Buyers*	*Sellers*
COPPER				
Cash	£245½	£245¾	£241¾	£242
Three months ..	£244	£244¼	£241	£241½
Settlement ..	£245¾		£242	
Week's turnover	10,775 tons		11,500 tons	
LEAD				
Current ½ month	£71½	£71¾	£70¾	£70⅞
Three months ..	£71⅞	£72	£71	£71⅛
Week's turnover	5,075 tons		6,675 tons	
TIN				
Cash	£793½	£794	£802½	£803
Three months ..	£797	£798	£804	£805
Settlement ..	£794		£803	
Week's turnover	700 tons		585 tons	
ZINC				
Current ½ month	£87⅜	£87½	£85⅜	£85½
Three months ..	£87⅜	£87½	£85⅜	£85½
Week's turnover	6,000 tons		9,675 tons	

Mining Finance

President Brand's New Borehole

There have been some interesting items of development news from South Africa's gold mines, but none has been of anything approaching a market-stirring nature. First came President Brand, the O.F.S. producer in the Anglo 'American Corporation group, with a borehole result from the southern part of the property. The borehole, MG4, is situated 3,050 ft. south of the No. 2 shaft and it cut the Basal reef at a depth of 6,092 ft. with an assay value of 26.9 dwts. gold per ton over a corrected width of 13.2 inches, equivalent to 355 inch-dwts. Core recovery was complete and no deflection will be made.

This drill was put down in the southern and so far undeveloped part of the mine and completes a wide-spaced pattern of four here. The other three gave widely varying results, the best, 665 inch-dwts. at 4,465 ft., being obtained from the most easterly. There is thus some indication that the southern section of Brand may not be so rich as the northern area. But this cannot yet be entirely taken for granted. A fifth borehole to the south-east of the No. 2 shaft gave 1,078 inch-dwts. and then 3,376 inch-dwts. from a deflection. On September 8, President Brand is due to declare its balance dividend for the year to September 30. The total is expected to be brought up to 5s. 6d. again with a final of 3s. per 5s. share currently quoted at 57s. 6d.

STEYN'S NO. 3 SHAFT STRIKES

President Steyn has announced the first reef intersections in its new No. 3 shaft system which is in the southern section of the property and not far from the common boundary with Brand's southern section. The Steyn assays were unpayable. In the Main shaft, where the Basal occurred at 4,643 ft., in a faulted zone, and was not fully exposed over the shaft perimeter, the gold values averaged 9.68 dwts. a ton over a channel width of 17.88 inches, equal to 173 inch-dwts. In the Ventilation shaft at 4,579 ft. the reef, striking north to south and dipping in an easterly direction at approximately 22 degrees, was fully exposed and averaged 13.87 dwts. over 12.62 inches, or 175 inch-dwts. Past borehole results in this undeveloped southern area also produced unpayable assays.

Steyn's final dividend is due on September 8. The optimists are hoping that it will be unchanged at 1s. 3d. But the pessimists, who seem to be in the majority, think that the cut to 1s. made last March will not be restored at this particular juncture. Present price of the 5s. shares is 20s. 6d.

WESTERN AREAS DOWN TO THE REEF

Western Areas Gold Mining, the Johannesburg Consolidated group mine that lies to the south of Randfontein, has made its first reef strikes in the initial shaft system which is situated in the northern part of the property. The values obtained were not all that exciting, but the extensive drilling that was carried out by " Johnnies" in this region a year or two ago indicated that the area in which the two shafts are being sunk might well be a below-average part of the mine.

The site, in other words, was chosen for reasons of technical convenience rather than to open up the richest part of the reef first. The attached table summarises these initial results from the Ventilation shaft which come from both actual intersections and also from sampling while cutting a station at a depth of 3,360 ft.

SHAFT

Name of Reef	*Depth below Collar* ft.	*No. of Sections Sampled*	*Channel Width Inches*	*Value Dwts.*	*Inch-Dwts.*
Ventersdorp Contact	3,327	16	21	3.2	67
Elsburg Series					
Mineralized conglomerate bands	3,334	4	41	3.4	139
in order of intersection in the	3,341	4	43	4.2	181
shaft	3,346	7	38	3.9	148
	3,351	16	61	2.8	171

STATION LAYOUT DEVELOPMENT

Ventersdorp Contact	3,360	12	35	4.5	158
Elsburg Series					
Separate mineralized conglo-	3,360	4	78	10.6	827
merate bands	3,360	9	64	4.3	275
	3,360	7	62	4.6	285
	3,360	6	76	5.9	448

It is stated that the dips of the V.C.R. and of the Elsburg series indicate that they are not conformable and largely as a result of this certain bands of the Elsburg series were not exposed over the full perimeter of the shaft. Although the various mineralized conglomerate bands both in the shaft and in the station development are well defined, no final correlation has been made at this juncture. The next reef data should come later on this year from the Main Shaft which is situated only 225 ft. from the Ventilation shaft.

SOME SOLACE FOR TREPCA HOLDERS

There has been a little bit of encouragement this week for Trepca Mines stockholders from the Selection Trust directors. The recent liquidator's report of Trepca was a gloomy document. Owing to the Pasic litigation there are still not the slightest signs of the actual liquidation being able to go forward and the company's cash and assets distributed. On top of this the liquidator cast doubts on the 8s. 6d. a share value that had always been taken for granted for the Treselca shares which Trepca holders are to be allocated in the ratio of one for four.

It has been taken for granted because Selection Trust had offered to purchase the Treselca shares for 8s. 6d. each, equal to 2s. 1¼d. per Trepca unit. But this offer had been dependent on a Stock Exchange quotation being granted for Treselca. And the liquidator thought that it was now doubtful whether this would be forthcoming because Treselca's cash resources had been exhausted on abortive exploration and there had also been a decline in the value of the interests that it held.

Now Selection Trust announces that if a Stock Exchange quotation is not obtained for Treselca the trust will negotiate with the liquidator and try to rearrange matters so that stockholders will receive the same amount in cash as would have been obtainable under the original offer. This is certainly some comfort. But the receipt by Trepca holders of the whole 6s. 6d. per 5s. stock unit represented by the present arrangement still seems as far away as ever. Current price of Trepca is 3s. 9d.

GEEVOR NOT DEVELOPING WELL

The full report of Geevor Tin, the Cornish producer, shows that the lower net profit of £30,773 in the year to last March, against £38,854 for 1958-59, was due to reduced output (648 tons against 683 tons as stated here on August 12), higher expenses including increased rates, and less from the sale of flotation residues and from interest on investments. An offsetting factor was the higher metal price which averaged £45 more in London during the period at £790 a ton.

The fall in investment income was due to the sale of investments to the value of over £81,000 in order to meet the 4s. 6d. a share capital return made in August, 1959. This reduced the book value of quoted investments from £304,628 to £98,811. The market value on March 31 last was £172,541. Taking this figure into account net liquid assets at that date totalled £335,254 compared with the modest issued capital of £103,200 in 5s. shares which now stand at 21s. 3d. ex dividend to yield 11.7 per cent.

This generous return reflects, in part, doubts about the mine's life and it cannot be said that the chairman, Mr. George W. Sims, is very reassuring on this point. He says that generally speaking development results throughout the year have been disappointing. The company's difficulties have been increased by the entry of the sea into the undersea workings of the old Levant mine which means a restriction of development possibilities in the direction of the main pitch of the ore shoots.

MR. SIMMS' TAXATION PLEA

If the ore reserve position is to be maintained it is, Mr. Simms says, essential to intensify efforts to discover other pay lodes within reach of the present workings. A drilling programme has thus been put in hand. Ore reserves on March 31 totalled 190,990 tons, 11,552 tons less than a year previously, and equal to about three years' mill supply. Actually, if Geevor is to maintain its production it looks as though it will have to mill more because the grade of the mine appears to be falling. Output has kept up so far in the current financial year, totalling 217 tons for the first four months thereof.

Mr. Simms concludes his statement with another appeal for more enlightened mine taxation in the U.K. to bring it into line with Canada, Australia, the U.S. and even Eire. In view of the position in Bolivia, Indonesia and now the Congo, " it seems a reasonable expectation that world supplies of tin are likely to be adversely affected in future". If that be so, " surely the time has come to encourage the development of the tin mining industry in this country". And the first essential step is alleviation of taxation by way of adequate depletion allowances for a wasting asset and recognition of the high risk nature of mining enterprise by granting tax relief in the early operating stages as, for instance, is done in Canada.

CHANGE-OVER AT SUNGEI KINTA

Sungei Kinta Tin Dredging is a concern that was hard hit by output restriction and has not paid a dividend since 1957. On top of this it was announced last April that the dredge had been closed down at the end of March pending a decision whether to switch over from dredging to opencast mining.

The change-over to opencast operations is now in progress and in his annual statement this week the chairman, Mr. Ellerton Binns, says that if government permission is granted, as anticipated, without undue delay, the first opencast unit should be in operation by about February, 1961. Two further units are planned and will then be installed as quickly as possible.

Meanwhile, Mr. Binns gives a warning about the company's results for the current year. He says that with output confined to tributers during the last nine months of the period and with all efforts concentrated on the change in mining methods, the year 1960 " can hardly be expected to be a profitable one". He points out that the change-over cannot be effected without a certain amount of capital expenditure. Hence the omission of a dividend for 1959 which also meant, incidentally, a substantial saving in tax. As an O.T.C. Sungei Kinta is not liable for U.K. tax on profits earned overseas but only on earnings distributed as dividend. The £1 units stand at 15s. A good deal of patience is likely to be needed.

LONDON MARKET HIGHLIGHTS

Not surprisingly, business remained at a low ebb in African mining share markets last week. The Congo once more provided its daily quota of disturbing political reports and the imminence (October 5) of the South African referendum on becoming a republic provided little encouragement to deal in Kaffir for the time being. And to lessen interest in mines even further, the Industrial sections were moving sharply upwards.

But despite this discouraging background, both Kaffir and Copper share prices began to improve after a rather uncertain start. The former were definitely assisted by a revival of demand from Johannesburg—there was little buying power elsewhere. Much of this Cape enquiry stemmed from institutional buyers there and it was particularly noted in the finance group. Shares such as Anglo American (147s. 6d.), General Mining (93s. 9d.) and West Rand Investment (45s. 7½d.) showed useful gains.

Apart from this demand, dividend hopes began to play a part. Anticipations of a higher payment from St. Helena lifted the shares 2s. 6d. to 67s. 6d. and similar hopes kept Western Holdings at 118s. 9d.

Dividend estimates were also a factor in the turn for the better in Copper shares. It was confidently predicted that the October declarations of Rhokana and " Rho-Anglo " would be particularly pleasing and the share prices responded accordingly, rising to 48s. 1½d. and 60s. respectively. There was also a certain amount of talk that a payment from Bancroft might not be far away and the shares fluctuated around 18s. 6d. in quite active trading. Selection Trust reflected the generally better feeling with a rise to 89s. 4½d. and a sudden demand lifted Tharsis to 61s. 10½d. in a market short of stock.

The Tin share market brightened on Tuesday following a recovery in the metal price and investment interest broadened on the following day. There was a certain amount of speculation as to whether the International Tin Council would recommend a further increase in export quotas for the final quarter of this year. At the same time it was pointed out that with present quotas at virtually 100 per cent of assessments, many mines are unable to produce any further tin. Those that still have unused capacity are already getting extra quota allocations from the Common Surrender Pool.

London buyers came in for Tanjong (26s. 9d.), Southern Malayan (19s.) and Pahang (11s. 9d.). The East seemed particularly interested in Sungei Besi (26s. 3d.) and Tronoh (37s.). A strong upward movement got under way in Beralt, lifting the shares to 34s. 3d. in front of the preliminary profit and final dividend announcement. Geevor, however, eased to 21s. following the chairman's statement and the annual report.

Lead-zincs failed to develop any decisive trend. Mount Isa responded to the usual Australian enquiry with a rise to 53s. but Broken Hill South sagged to 11s. 3d. Consolidated Zinc, which tend to move in sympathy with the Industrial sections, hardened only slightly to 78s.

CORNISH MINING: Wanted for study books, accounts, documents, worthless shares. Brooke, Kennet End, Harrow Park, Harrow on the Hill, Middlesex.

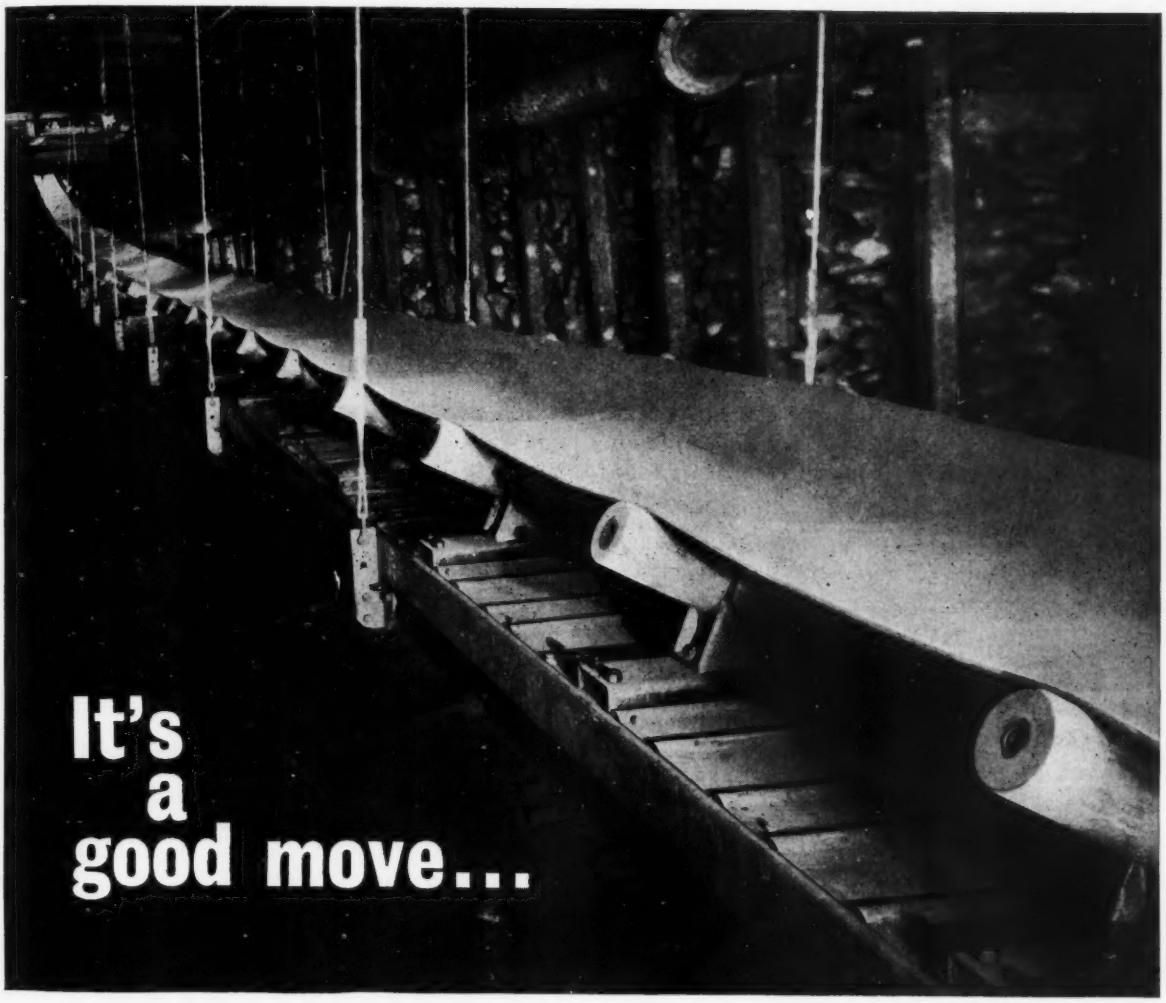
EXPERIENCED MASTER SINKER required by British Gold Mining Company in Ghana. High pay and bonuses to suitably qualified man. 12 month foreign tours and 3 months' paid leave. Continuous contract. Passages and house provided for applicant and wife. Pension Scheme. Write with full details to Box 673, c/o *The Mining Journal Ltd.*, 15 Wilson Street, Moorgate, London, E.C.2.

The Proprietors of British Patent No. 768.031 for "APPARATUS FOR INSERTING CASING LININGS IN BORE HOLES", desire to enter into negotiations with a firm or firms for the sale of the patent or for the grant of licences thereunder. Further particulars may be obtained from Marks and Clerk, 57 and 58 Lincoln's Inn Fields, London, W.C.2.

The Proprietors of British Patent No. 771274 for "AN IMPROVED CASING TUBE CLAMP FOR LARGE-HOLE BORINGS", desire to enter into negotiations with a firm or firms for the sale of the patent or for the grant of licences thereunder. Further particulars may be obtained from Marks and Clerk, 57 and 58 Lincoln's Inn Fields, London, W.C.2.

VENTILATION OFFICERS required by British Gold Mining Company in Ghana. One experienced man to take charge of Ventilation of group of mines, one junior man for single mine. Starting salaries not less than £150 per month and £80 per month respectively. 12 month foreign tours and 3 months' paid leave. Continuous contract. Passages and house provided for applicant and wife. Pension Scheme. Write with full details to Box 675, c/o *The Mining Journal Ltd.*, 15 Wilson Street, Moorgate, London. E.C.2.

MINE CAPTAIN required by British Gold Mining Company in Ghana. Applicants should hold a Degree in Mining and have at lease 5 years' Metal Mining experience. High pay and bonuses to suitably qualified man. 12 month foreign tours with 3 months' paid leave. Continuous contract. Passages and house provided for applicant and wife. Pension Scheme. Write with full details to Box 674, c/o *The Mining Journal Ltd.*, 15 Wilson Street, Moorgate, London, E.C.2.



to install *Nylon* conveyor belting and reduce your cost per ton carried

Nylon heavy duty conveyor belting has real working strength. This practical advantage is strong on the right side of the ledger too. Nylon conveyor belts give a lower cost per ton carried than any other type of conveyor belting. Reductions in maintenance and replacement costs add up to an impressive figure. Nylon has high tensile strength and energy absorption; outstanding resistance to impact, abrasion of the edges and damage from flexing.

It cannot rot, is highly flexible, troughs better and allows smaller diameter drums to be used. For further facts and details about the unique qualities of nylon conveyor belting, please write to British Nylon Spinners Limited, 68 Knightsbridge, London, S.W.1.

Photograph by permission of the National Coal Board. Trunk conveyor, 1100 yards between centres, at Haig Colliery, Cumberland. 42 inches wide, 4 ply CN80 (nylon weft) belt by Barrow Hepburn & Gale, Mitcham.

B Nylon S

It's *Nylon* for strength

BRITISH NYLON SPINNERS LIMITED

Nylon conveyor belts are in daily use in Coal Mines, Open Cast Coal Mines, Quarries, Electricity Generating Stations, Sand and Gravel Pits, Brickworks, Iron and Steel Works, and Gas Works in U.K. and throughout the world.

BANK OF WEST AFRICA LIMITED

ESTABLISHED 1894
Sylvester Gates, C.B.E., Chairman

AUTHORISED CAPITAL £6,000,000

ISSUED AND FULLY PAID CAPITAL £4,000,000 · RESERVE FUND £2,500,000

Head Office: **37 Gracechurch Street, London E.C.3**

JOHN C. READ · GENERAL MANAGER

LIVERPOOL 25 Water Street . MANCHESTER 106-108 Portland Street . HAMBURG 49 Schauenburgerstrasse

Branches

GHANA
Accra (High St.)
Accra (Airport)
Accra
Accra (Tudu)
Achimota
Akropong-Akwapim
Awaso
Axim
Berekum
Bibiani
Bolgatanga
Cape Coast
Dormaa-Ahenkro
Dunkwa
Hohoe
Keta
Koforidua
Kumasi
Kumasi (College)
Kumasi (Kejetia)
Kumasi (Manhyia)
New Ta o
Nsawam
Obuasi
Oda
Sekondi
Sunyani
Swedru
Takoradi (Harbour)
Takoradi (Market Circle)
Tamale
Tarkwa
Techiman
Tema
Tepa
Wa
Wenchi
Winneba
Yendi

NIGERIA
Aba
Abeokuta
Agbor
Agege
Apapa
Benin City (Forestry Road)
Benin City (Central Lagos St.)
Bukuru
Calabar
Enugu
Gashua
Geidam
Gombe
Gusau
Ibadan
Ibadan (Agodi)
Ibadan (Agodi College)
Ibadan (Amunigun St.)
Ikare
Ikeja
Ikot Ekpene
Ilesha
Jos
Jos (Market)
Kaduna
Kaduna (Bank Rd.)
Kaduna (South)
Kano
Kano (Airport)
Kano (Fagge Ta Kudu)
Kontagora
Lagos (Marina)
Lagos (Broad St.)
Lagos (Ereko St.)
Lagos (Obun Eko)
Maiduguri
Mallam Fashi
Nguru
Ogbomosho
Onitsha (New Market Road)
Onitsha (Bright Street)
Oshogbo
Owo
Oyo
Port Harcourt
Port Harcourt (Town)
Sapele
Sapele (Town)
Shagamu
Sokoto
Umuahia
Uyo
Warri
Zaria
Zaria (College)

SIERRA LEONE
Bo
Bonthe
Freetown
Freetown (Deep Water Quay)
Koidu
Pendembu
Port Loko
Segbwema

CAMEROONS (Br. Mandate)
Victoria

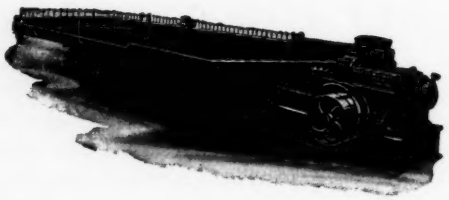
CAMEROUN
Duala

GAMBIA
Bathurst

Every description of Banking Business undertaken. · **The Bank provides exceptional facilities for financing trade with West Africa**

G137-D

"WILFLEY"
CONCENTRATING TABLES



Send for leaflet introducing the new No. 25 table with 'CURNOW' spring suspension.

Sole Proprietors

THE WILFLEY MINING MACHINERY Co. Ltd.

Allen Road, Rushden, Northamptonshire

Phone: Rushden 3340 *Grams:* "WRATHLESS" RUSHDEN

BALL MILLS · PUMPS · MACE SMELTERS

ABEM

GEOPHYSICAL INVESTIGATIONS

for ore prospecting, oil exploration, and civil engineering.

FROM THE AIR

ON THE GROUND

UNDER WATER

IN MINES & BOREHOLES

THE ABEM COMPANY

DANDERYDSGATAN 11, STOCKHOLM, SWEDEN
Telegrams: Prospecting

Metal and Mineral Trades

A. STRAUSS & CO. LTD.

FOUNDED 1875

PLANTATION HOUSE, MINCING LANE, LONDON, E.C.3

METALS
Telephone: Mincing Lane 5551 (10 lines)
Telegrams: Straussar Phone London

Telex GB LN 28858

RUBBER
Telephone: Mansion House 9082 (3 lines)
Telegrams: Ascorub Phone London

MERCHANTS EXPORTERS IMPORTERS

Non-Ferrous Metals — Virgin, Alloys, Scrap
RUBBER COPPER REFINERS

Members of the London Metal Exchange
Dealer Members of the Rubber Trade Association
Members of the National Association of Non-Ferrous Scrap Metal Merchants

EVERITT & Co. LTD.

Teleg. Address: Persistent, Liverpool

40 CHAPEL STREET
LIVERPOOL
Phone: 2995 Centra

SPECIALITY:
MANGANESE PEROXIDE ORES

We are buyers of:
WOLFRAM, SCHEELITE, VANADIUM, MOLYBDENITE, ILMENITE, RUTILE, ZIRCONIUM and TANTALITE ORES

Suppliers of:
FERRO-ALLOYS & METALS, NON-FERROUS ALLOYS

BLACKWELLS FOR ALLOYS

Buyers and consumers of
- COLUMBITE
- TANTALITE
- TUNGSTEN
- MANGANESE

Makers of FERRO ALLOYS, NON-FERROUS ALLOYS
RARE METALS

BLACKWELL'S METALLURGICAL WORKS
Dept. 11., THERMETAL HOUSE, GARSTON, LIVERPOOL, 19
Telephone: Garston 980 Telegrams: Blackwell, Liverpool

Telegrams:
"BASSETT" PHONE, LONDON.

Telephone:
MANSION HOUSE 4401/3.

BASSETT SMITH & Co. Ltd.

(Incorporating George Smith & Son)

15/18 LIME ST., LONDON, E.C.3

METALS,
ORES (Copper, Zinc, Lead, &c., Complex),
RESIDUES, SKIMMINGS & ASHES
NON-FERROUS SCRAP

ROURA & FORGAS, LTD.

Telephone No:
GERRARD 9641

Sole Sterling Area Suppliers of

ITALIAN QUICKSILVER

COLQUHOUN HOUSE,
27/37 BROADWICK STREET, LONDON, W.1

Cable Address : WAHCHANG, NEW YORK

WAH CHANG CORPORATION

(FORMERLY WAH CHANG TRADING CORPORATION)

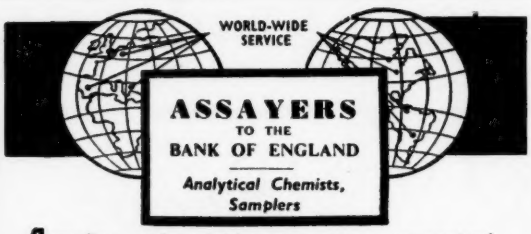
233 BROADWAY - - NEW YORK 7, NEW YORK

TUNGSTEN TIN

BUYERS
Tungsten Concentrates, Tungsten Tin Concentrates
Mixed Tungsten Ores
Tungsten Tailings, Scraps, Tips, Grindings
Tin Concentrates—Tin Dross, Tin Furnace Bottoms

SELLERS
Tungsten Concentrates to Buyers' Specifications
Tungsten Salts, Tungsten Powder
Tungsten Rods and Wires
Tungsten Ingots, Tin Oxides, Tin Chlorides

PLANT — GLEN COVE, NEW YORK



ASSAYERS
TO THE
BANK OF ENGLAND
Analytical Chemists, Samplers

Sampling and weighing operations supervised
At ports and works, of shipments and parcels of
Minerals, base metals, alloys, scrap—also
Precious metals, residues, slags, etc.
Local representatives available
In Great Britain and abroad, all having
Necessary experience and qualifications.

GRIFFITH DANIEL C. & CO. LTD.
27/33 PAUL STREET, LONDON, E.C.2
Tel.: MON 1314 (3 lines) Grams: GRYFFYDD, LONDON
Branch Office: LEFKA, Cyprus.
Represented throughout Great Britain, also in Australia, Belgium, Canada, Denmark, France, Germany, Holland, India, Italy, Japan, New Zealand, Poland, Portugal, Spain, Sweden, Switzerland, U.S.A.

RHONDDA METAL CO. LTD.
25 UPPER BROOK STREET, LONDON, W.1.
Works: PORTH, GLAM.
PHOSPHOR COPPER,
PHOSPHOR BRONZE, LEAD BRONZE,
GUNMETAL, BRASS
Telephone: HYDE PARK 4010 Cables: RONDAMET

BARNET METAL CO., LTD.
Elektron House, Brookhill Road, New Barnet, Herts
Phone: Barnet 5187 and 3901
STOCKISTS OF: Aluminium, Brass and Copper
BUYERS OF: all non-ferrous scrap
The RIGHT firm to deal with

MINING & CHEMICAL PRODUCTS LIMITED
86 Strand
London WC2
Telephone
Covent Garden
3393

Buyers of Ores, Concentrates and Residues of
BISMUTH
INDIUM
SELENIUM

AYRTON AND PARTNERS LIMITED
NON-FERROUS METALS
ORES · MINERALS AND RESIDUES
TELEPHONE: MONarch 7541
TELEX: LONDON 2-2475
CABLES: PARTONAYR
IMPERIAL HOUSE
DOMINION STREET
LONDON . E.C.2

FRANK & SCHULTE
Handelsgesellschaft m.b.H.
(Incorporating Frank & Dieckmann G.m.b.H.
ALFREDSTRASSE 152 POSTBOX 515
ESSEN, GERMANY
Telegrams: Silizium Teleprinter No. 0857835 Telephone: 44001
ORES MINERALS FERRO-ALLOYS
METAL-ALLOYS METALS
CHEMICALS REFRACTORIES
SELENIUM and ROCK CRYSTAL
Established 1922
OFFERS AND AGENCIES SOLICITED

THE STRAITS TRADING COMPANY LIMITED
P.O. Box 700, OCEAN BUILDING, SINGAPORE
Works: SINGAPORE & PENANG

STRAITS REFINED TIN
— "THE STRAITS TRADING CO. LTD." BRAND —

THE BRITISH TIN SMELTING CO. LTD., LIVERPOOL

London Agents:
W. E. MOULSDALE & CO. LTD., 2 Chantrey House, Eccleston Street, S.W.1

THE CHROME COMPANY LTD.

Rhodesian and Transvaal Chrome Ores

Metallurgical
Refractory and
Chemical Grades

AVAILABLE FOR PROMPT SHIPMENT

103 MOUNT STREET · LONDON · W.1.

Telephone	*Telegrams*	*Telex*
HYDE PARK 9951	**ORECOS LONDON**	**ORECOS LONDON 23189**

MARKETING SHIPPING

ORES & MINERALS

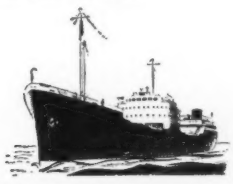
MANGANESE · DIOXIDE
IRON · OXIDE
CHROME
VANADIUM
LITHIUM
ILMENITE · RUTILE · ZIRCON
ANTIMONY · BARYTES · TANTALITE etc.

FERRO-ALLOYS & METALS

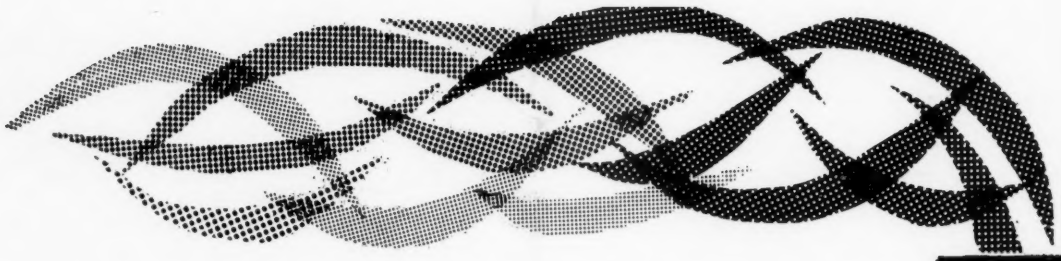
FERGUSSON WILD
& COMPANY LIMITED

3 St. Helen's Place, London, E.C.3
Telephone: LONDON WALL 7022 (10 lines)
Cables: FERGUSONIA LONDON
Telex Number: GB LN 28801

BROKERS
CHARTERERS



BROKER MEMBERS OF THE BALTIC AND INTERNATIONAL MARITIME CONFERENCE



DUST EMISSION PROBLEMS

from any of the processes listed below

CAN BE SOLVED

by consulting the pioneers of Electrostatic Precipitation

Lodge-Cottrell

CEMENT INDUSTRY
(Kiln Gases)

PLASTER INDUSTRY
(Kettle fog dryer)

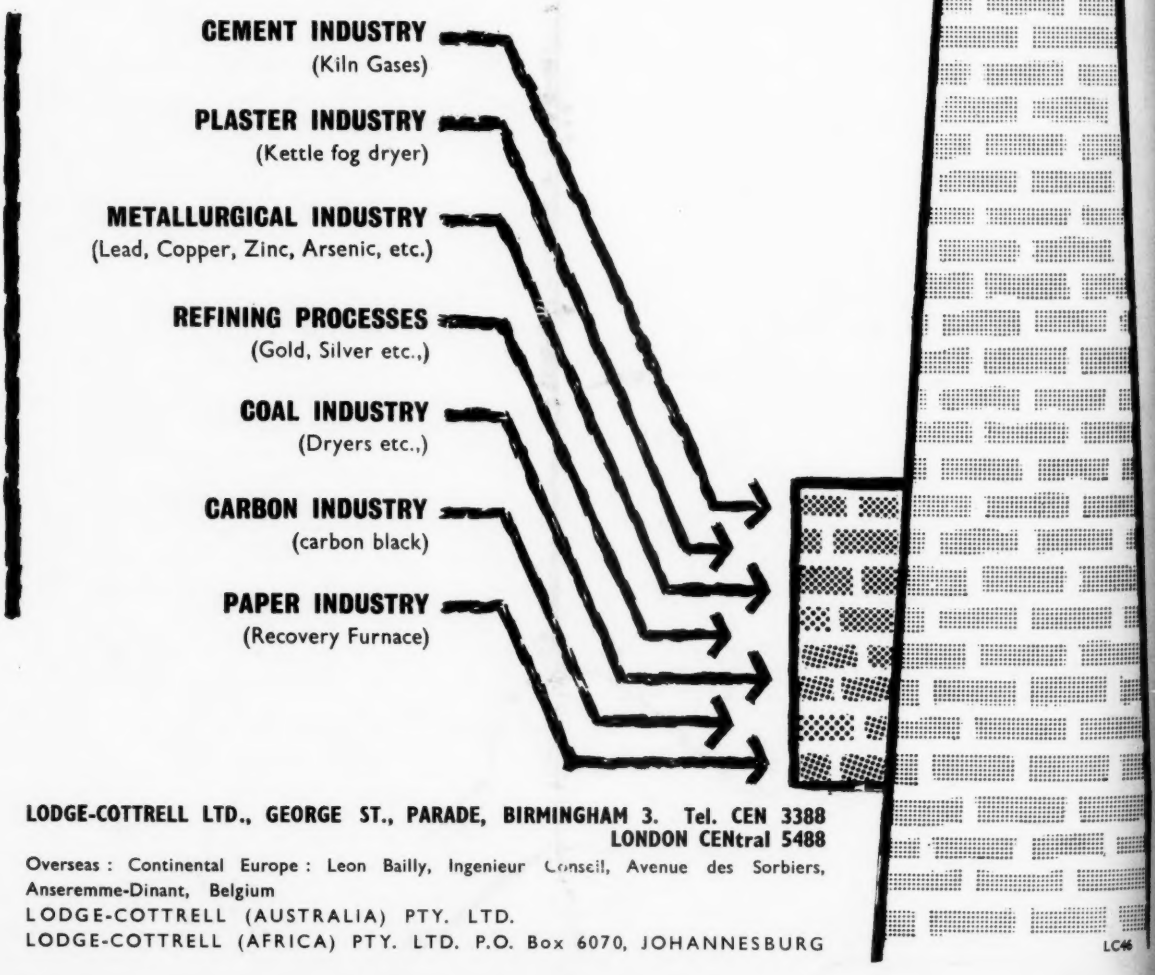
METALLURGICAL INDUSTRY
(Lead, Copper, Zinc, Arsenic, etc.)

REFINING PROCESSES
(Gold, Silver etc.,)

COAL INDUSTRY
(Dryers etc.,)

CARBON INDUSTRY
(carbon black)

PAPER INDUSTRY
(Recovery Furnace)



LODGE-COTTRELL LTD., GEORGE ST., PARADE, BIRMINGHAM 3. Tel. CEN 3388
LONDON CENtral 5488

Overseas : Continental Europe : Leon Bailly, Ingenieur Conseil, Avenue des Sorbiers, Anseremme-Dinant, Belgium
LODGE-COTTRELL (AUSTRALIA) PTY. LTD.
LODGE-COTTRELL (AFRICA) PTY. LTD. P.O. Box 6070, JOHANNESBURG

LC46

Published by The Mining Journal Ltd., 15 Wilson Street, Moorgate, London, E.C.2, and printed by Washburn & Sons Ltd., Queens Road, Southend-on-Sea, Essex. Registered as a Newspaper.